



ERTMS/ETCS

FFFIS STM Test cases of Functional identity 007

DMI FUNCTION

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AZD		
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1. TEST CASE DIAGRAMS

1.1 Configuration

1.1.1 Diagram

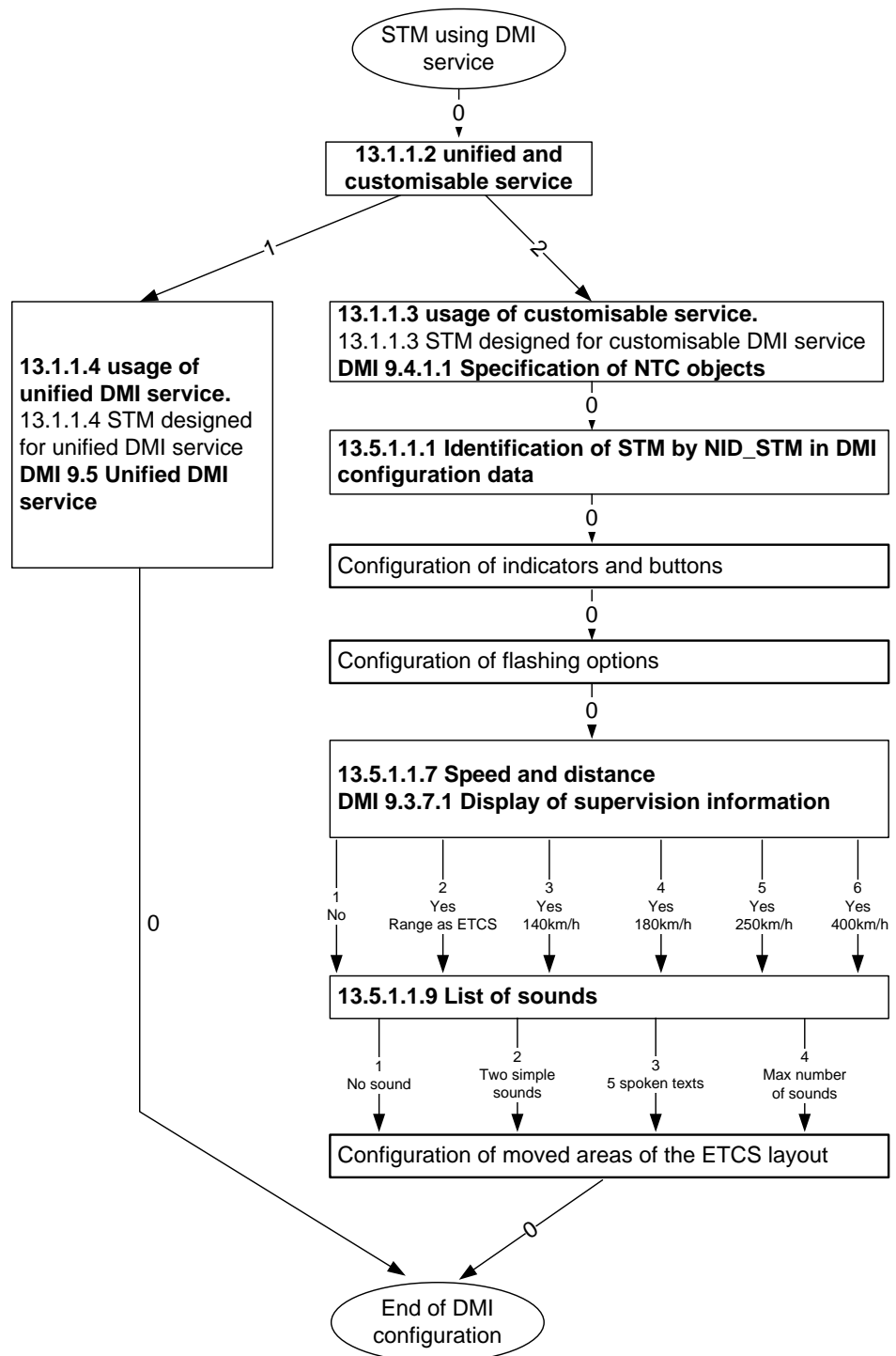


Diagram 1 – 7 a1 –Configuration main

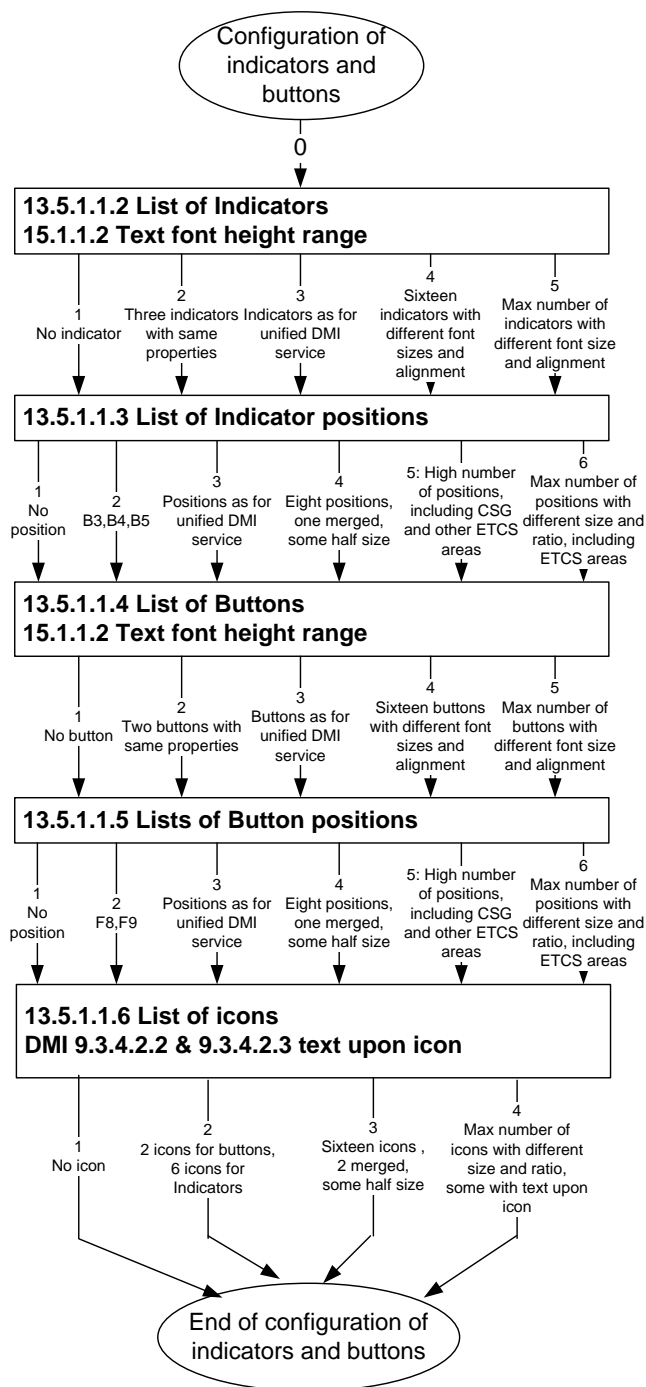


Diagram 2 – 7 a2 – Options for indicators and buttons

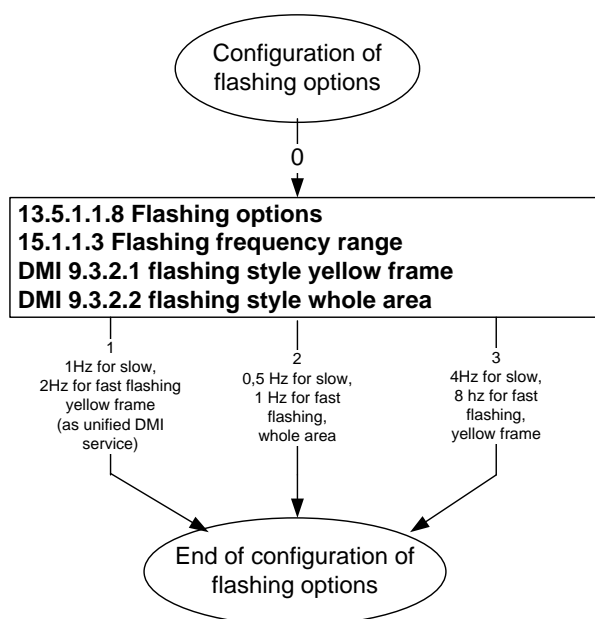


Diagram 3 – 7 a3 – Flashing options

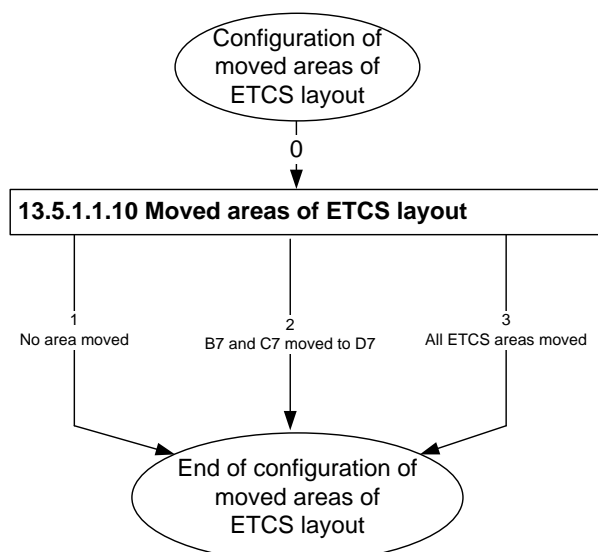


Diagram 4 – 7 a4 –Configuration of moved ETCS areas

1.1.2 Relevant requirements

1.1.2.1 ETCS DMI Specification [12]

Chapter	Text
9.3.2.1	When flashing style 'yellow frame' is selected, each NTC indicator or button requested to flash by the STM shall be surrounded by a flashing frame as specified in 5.1.1.3.1.
9.3.2.2	When flashing style 'whole area' is selected, each NTC indicator or button requested to flash by the STM shall toggle between visible and not visible state (i.e. the dark blue background colour).
9.3.4.2.2	If the STM uses the customisable DMI, the caption text shall also be visible, if "display of text upon icon" is requested as corresponding icon attribute in the configuration data.

9.3.4.2.3	Otherwise the caption text shall be ignored by the ERTMS/ETCS on-board.
9.3.7.1	If the STM uses the customisable DMI service and is configured to display such information or it uses the unified DMI service, the speed and distance supervision information sent by the STM shall be displayed by the ERTMS/ETCS on-board according to the following rules: ...
9.4.1.1	The size and position of NTC DMI objects shall be specified in cells using the same coordinate system with 640x480 cells as specified in 6.2. The position of an object shall be defined as the offset of the upper left corner of the object from the upper left corner of the total grid array. It shall be retrieved from the configuration data using the position identifier sent by the STM. The specification of the customisable DMI service consequently does not reuse the ETCS layout except when explicitly referring to the name of an ETCS area.
9.5	Unified DMI service (whole section)

1.1.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.1.1.2	The DMI Function shall provide the unified DMI and the customisable DMI services
13.1.1.3	... The ERTMS/ETCS on-board shall be configurable to store this information and serve the STM DMI requests according to this configuration. The customisable DMI service shall be used, when configuration data for a customisable DMI layout are stored in the ERTMS/ETCS on-board for the NID_STM of the STM.
13.1.1.4	... The unified DMI service shall be used, when no configuration data for a customisable DMI layout is stored in the ERTMS/ETCS on-board for the NID_STM of the STM.
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.1	The NID_STM of the STM.
13.5.1.1.2	The list of Indicators defined for the STM with the following data for each Indicator: <ul style="list-style-type: none"> a) identifier (a number); b) font size (height in cells); c) horizontal text-alignment (left, right or centred); d) vertical text-alignment (upper part, lower part or centred).
13.5.1.1.3	Two lists of Indicator positions (one list for soft key technology and one list for touch screen technology) defined for the STM, and for each Indicator position: <ul style="list-style-type: none"> a) identifier (a number); b) x:y offset of the upper left corner in cells; c) x:y size of the area in cells.
13.5.1.1.4	The list of Buttons defined for the STM with the following data for each Button: <ul style="list-style-type: none"> a) identifier (a number); b) font size (height in cells); c) horizontal text-alignment (left, right or centred); d) vertical text-alignment (upper part, lower part or centred).
13.5.1.1.5	Two lists of Button positions (one list for soft key technology and one list for touch screen technology) defined for the STM and, for each Button position:

	<ul style="list-style-type: none"> a) identifier (a number); b) x:y offset of the upper left corner in cells; c) x:y size of the area in cells; d) linked soft key (for soft key technology).
13.5.1.1.6	<p>The list of Icons defined for the STM and, for each Icon:</p> <ul style="list-style-type: none"> a) identifier (a number); b) bitmap, as RGB bitmap file (according to Microsoft BMP file format); Pixels in the bitmap files shall be understood as cells. c) display of text upon icon: yes/no.
13.5.1.1.7	<p>ETCS speed and distance supervision</p> <ul style="list-style-type: none"> a) For speed and distance supervision display in speed dial as for ETCS in area B0-B2, B6 and A2-A3 (applicable as long as the STM is active): b) Yes/No; “Yes” means that the ETCS train speed display is re-used as such together with the supervision information as specified in 13.4.6. “No” means that there is no display of speed and distance supervision in the ETCS way. c) if Yes: speed dial range (0-140/180/250/400 km/h or same range as ETCS).
13.5.1.1.8	<p>Options for flashing of Indicators and Buttons (additionally to flashing mode):</p> <ul style="list-style-type: none"> a) the frequency for slow and fast flashing; b) the flashing style either as ‘yellow frame’ or as ‘whole area’.
13.5.1.1.9	<p>The list of Sounds defined for the STM and, for each sound, its Sound definition:</p> <ul style="list-style-type: none"> a) identifier (a number); b) sound, as WAV file (according to Microsoft WAV file format);
13.5.1.1.10	<p>Moved areas of the ETCS layout:</p> <ul style="list-style-type: none"> a) If a STM needs partially or totally the cells used by an area defined in the ETCS layout and in which ETCS DMI objects are displayed in level NTC modes SN or NL, the ETCS objects displayed in it must be moved somewhere else on the national layout. Therefore it shall be possible to specify a changed location for moving the following ETCS areas and their related ETCS objects. For buttons also the new related soft key (F1-F5) must be defined: <ul style="list-style-type: none"> • Areas F1-F5 for the buttons for selecting the main, override, data view, special or settings window; • Area A4 for the adhesion “slippery rail”; • Areas B7 and C8 for the ETCS mode and level display;

	<ul style="list-style-type: none"> • Area C1 for the mode/level acknowledgements; • Area C7 for the Override status indication; • Area C9 for the brake indication; • Area E1 for safe radio connection indication; • Area G13 for local time <p>b) The new location shall be specified by a new x:y position in cells.</p> <p>c) The moved areas shall have the same size as the original ETCS areas.</p>
15.1.1.2	The allowed text font height range for the configurable elements of the DMI layout of an STM using the customisable DMI service shall be from 8 to 60 cells.
15.1.1.3	The allowed range for the frequencies for slow and fast flashing for an STM using the customisable DMI service is 0,5 – 8 Hz.

1.1.2.3 For STM from FFFIS STM specification [3]

Chapter	Text
13.1.1.3	An STM designed for usage with a customisable DMI provides a set of configuration data for its default window as part of its product documentation as described in chapter 15.5. ...
13.1.1.4	An STM designed to use the unified DMI provides no configuration data as part of its product documentation....

1.2 Indicators

1.2.1 Diagram

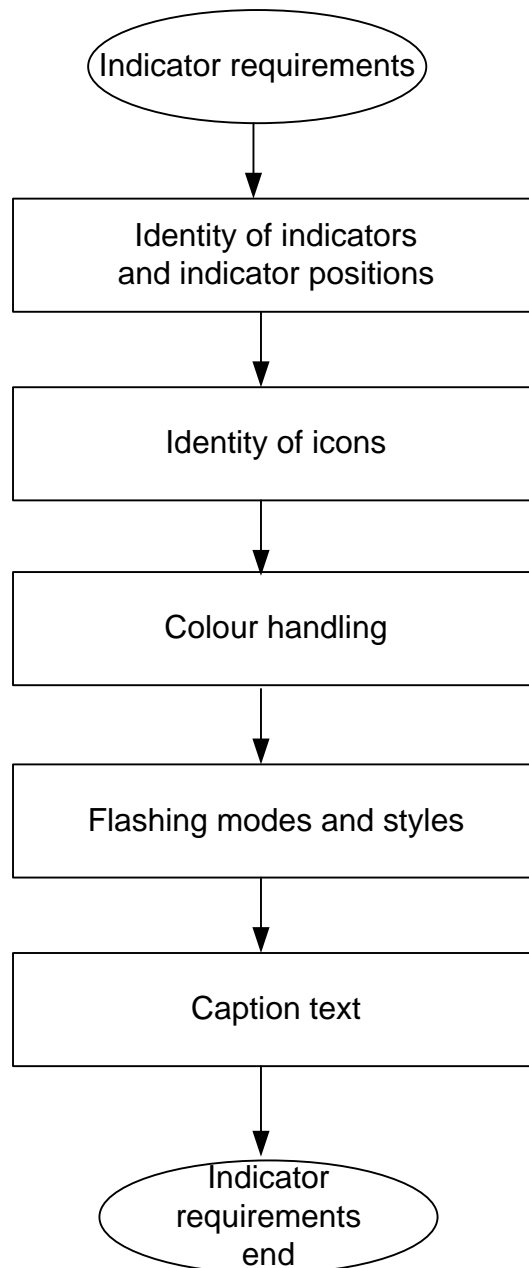


Diagram 5 – 7 b1 – Indicators main

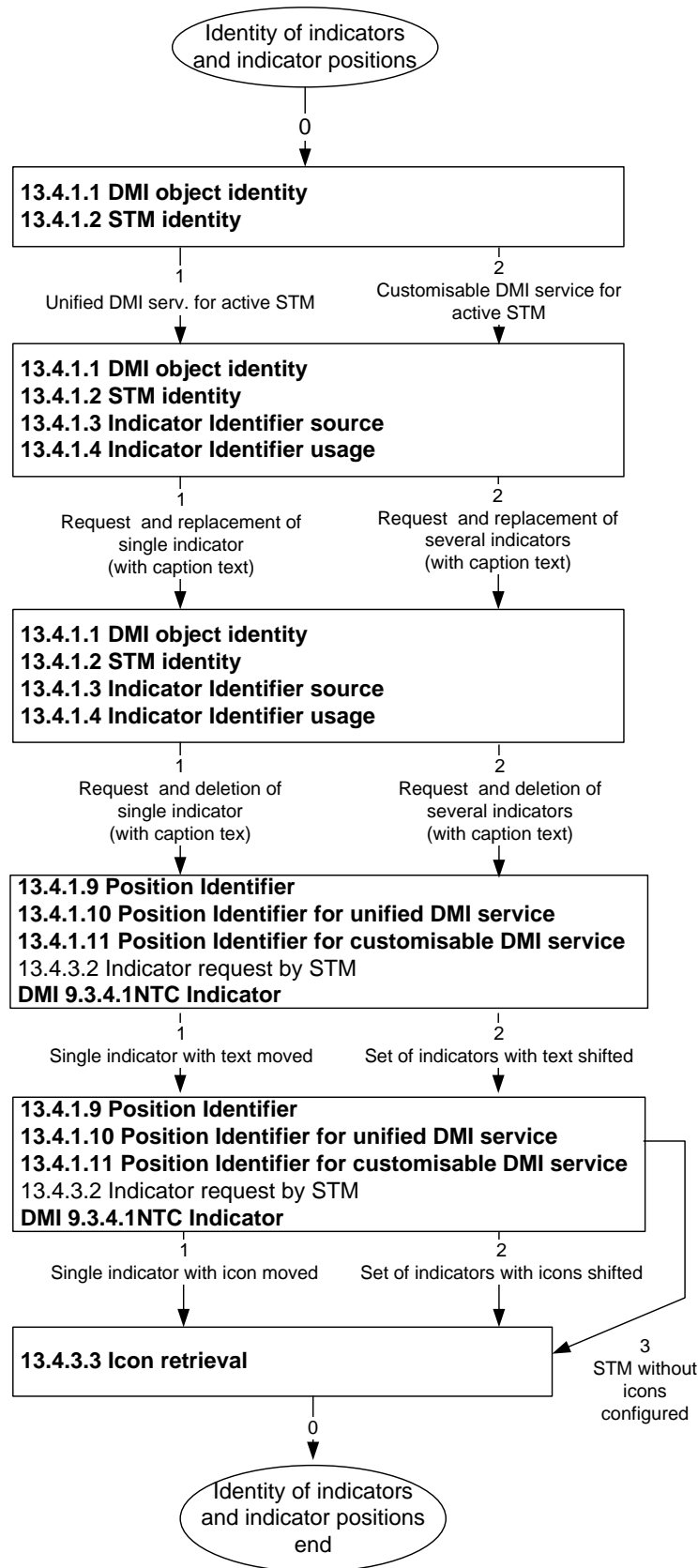


Diagram 6 – 7 b2 – Identity of indicators and indicator positions

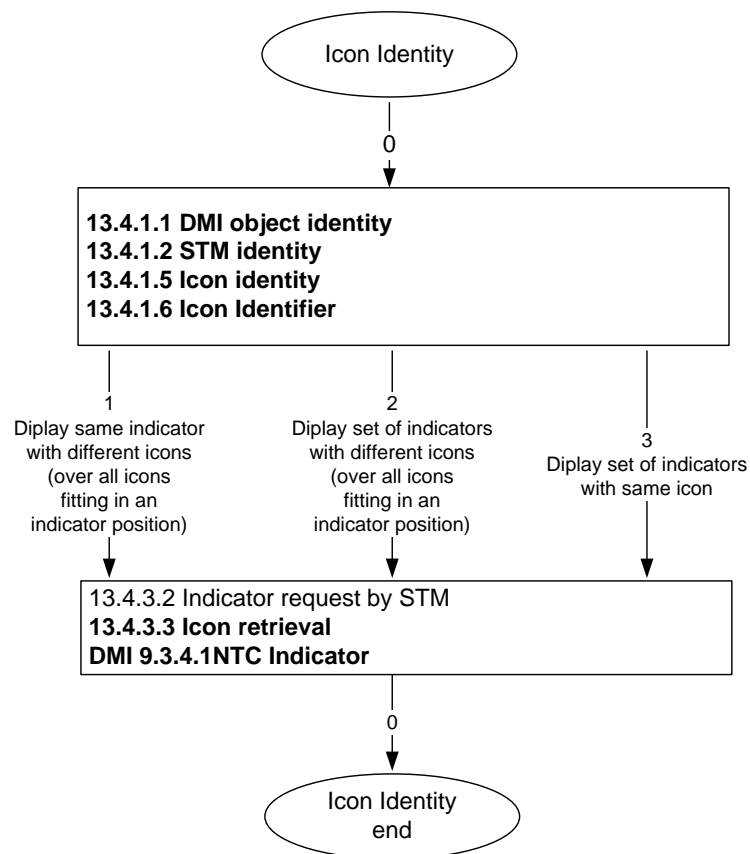


Diagram 7 – 7 b3 – Indicators: Identity of Icons

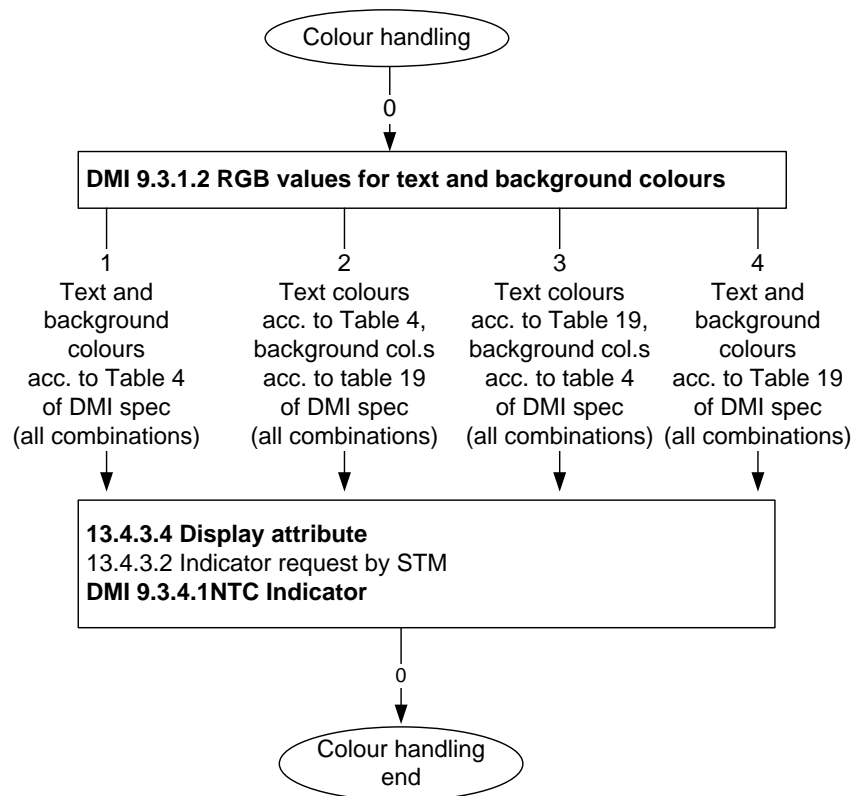


Diagram 8 – 7 b4 – Indicators: Colour handling

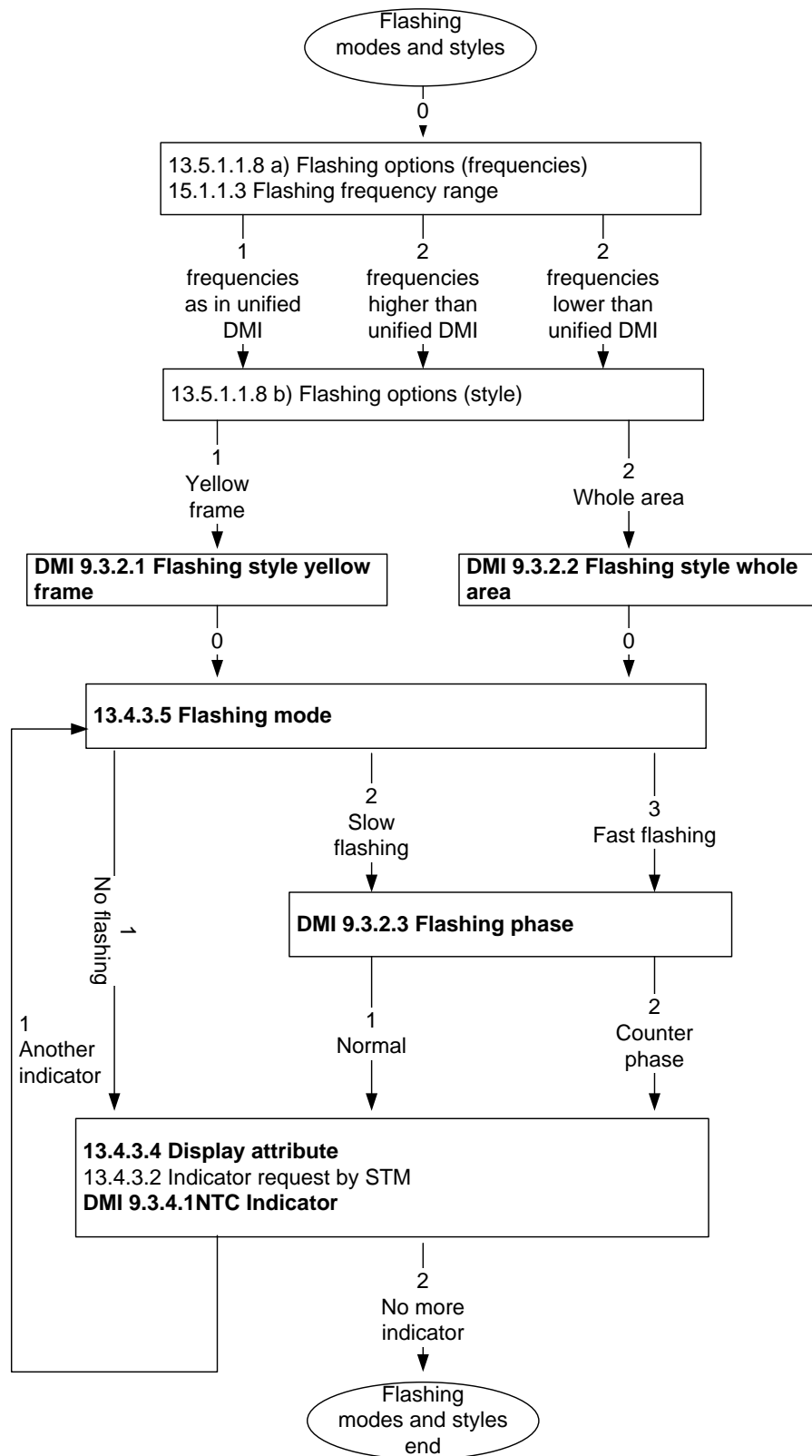


Diagram 9 – 7 b5 – Indicators: Flashing mode and style

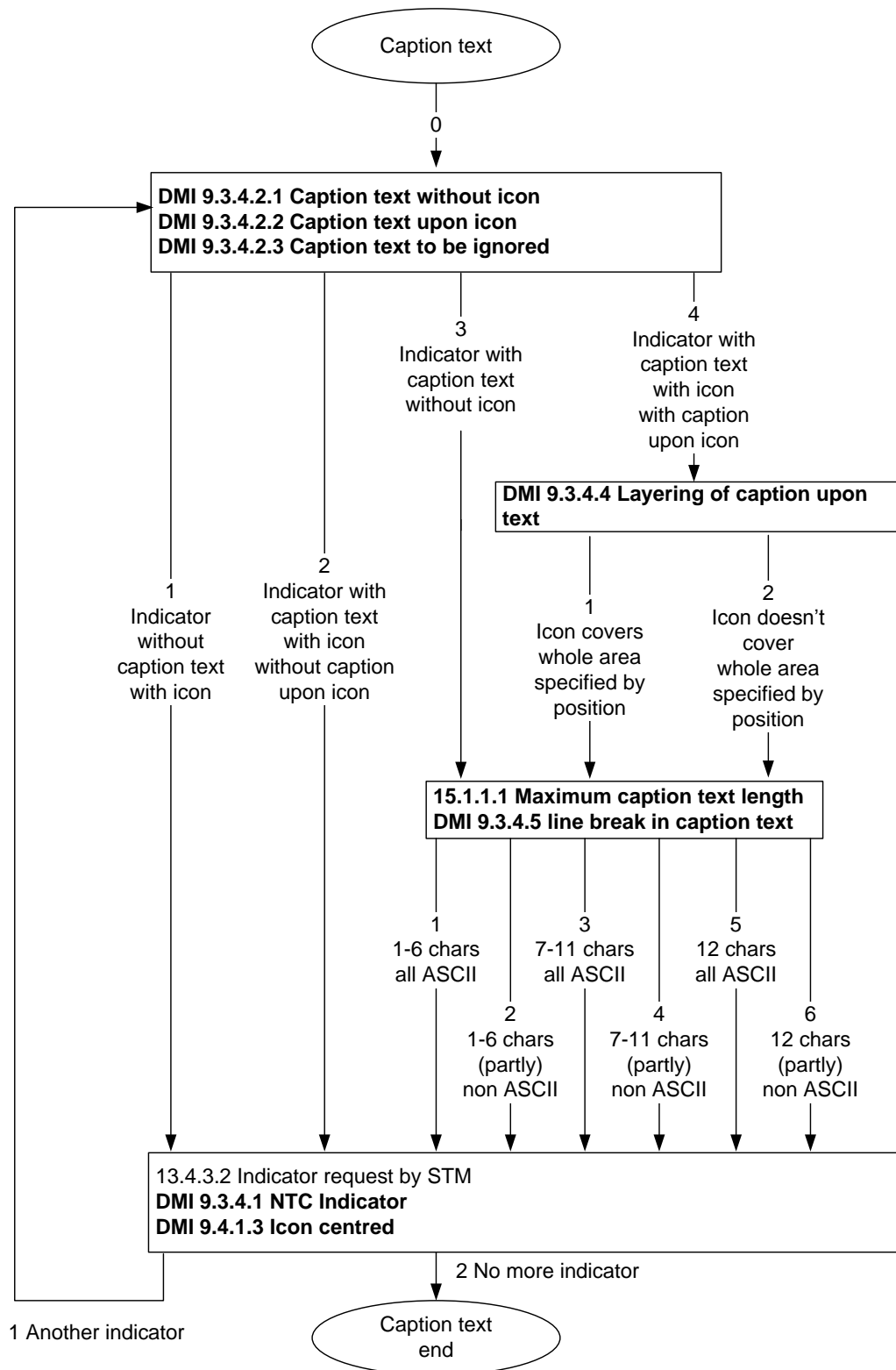


Diagram 10 – 7 b6 –Indicators: Caption text

1.2.2 Relevant requirements

1.2.2.1 ETCS DMI Specification [12]

Chapter	Text
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9.3.1.2	The colours requested by the text, indicator or button attribute of a STM request shall be displayed with RGB values as specified for ETCS objects in Table 4. The additional colours not specified for ETCS objects shall be displayed with the RGB values in Table 19.
9.3.2.1	When flashing style 'yellow frame' is selected, each NTC indicator or button requested to flash by the STM shall be surrounded by a flashing frame as specified in 5.1.1.3.1.
9.3.2.2	When flashing style 'whole area' is selected, each NTC indicator or button requested to flash by the STM shall toggle between visible and not visible state (i.e. the dark blue background colour).
9.3.2.3	Flashing of different objects shall be synchronised: all objects with normal flashing mode and the same frequency shall be in the same state at the same time ; objects with counterphase flashing shall be in the alternative state at this time.
9.3.4.1	An NTC indicator can display text and/or an icon. Its state may change by changing the contained text, icon, text colour, text background colour or flashing mode. Additionally its position may change.
9.3.4.2.1	The caption text shall always be visible when no icon is requested by the STM.
9.3.4.2.2	If the STM uses the customisable DMI, the caption text shall also be visible, if "display of text upon icon" is requested as corresponding icon attribute in the configuration data.
9.3.4.2.3	Otherwise the caption text shall be ignored by the ERTMS/ETCS on-board.
9.3.4.3	An indicator shall be displayed according to the display attribute sent with the indicator Request.
9.3.4.4	If both the caption text and the icon are displayed, the layering shall be text in foreground, icon in middle layer and background colour in background.
9.3.4.5	The part of the caption text from the seventh character shall be displayed on a second Line.
9.4.1.3	The customisable DMI service shall display icons centred in the specified area.

1.2.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.4.1.1	The DMI objects indicators and buttons used by the different STMs are assigned a unique object identity made of NID_STM and Indicator/Button Identifier.
13.4.1.2	The STM Identity is implicitly provided by the STM by its announced NID_STM (and repeated in each message header according to the language).
13.4.1.3	The Indicator/Button Identifier is provided by the STM as part of the corresponding Indicator/Button request.
13.4.1.4	The Indicator/Button Identifier is used by the STM to be able to change the state of objects and to move or remove them. The Button Identifier is also used by the ERTMS/ETCS on-board to transmit the button events to the STM. If the customisable DMI service is used, it is also used to define the properties of the object.
13.4.1.5	All icons (bitmap symbols) used by the different STMs using a customisable DMI are assigned an icon identity made of NID_STM and Icon Identifier.
13.4.1.6	An Icon Identifier can be provided by the STM as part of the corresponding Indicator/Button request.
13.4.1.9	For specifying the position of DMI objects, Position Identifiers are used.
13.4.1.10	If the unified DMI service is used, the Position Identifier specifies an area of

	the ETCS layout as defined in [12].
13.4.1.11	If the customisable DMI service is used, the Position Identifier and the NID_STM are used to define the position in cell coordinates and size as specified in the configuration data for this STM.
13.4.3.3	The Icon Identifier shall be used by the DMI Function in case of the customisable DMI service to retrieve from the configuration data the corresponding icon attached to an Indicator/Button object.
13.4.3.4	The display attribute shall specify the background colour and the flashing mode for the whole Indicator and the display colour of the caption text.
13.4.3.5	The flashing mode specifies if the slow, fast or no flashing and if normal or counterphase flashing shall be used
15.1.1.1	The maximum number of characters (coded in UTF-8 by 1 or 2 bytes) to display shall be <ul style="list-style-type: none"> b) 12 characters for button and indicator caption text in button and indicator requests.

1.2.2.3 For STM from FFFIS STM specification [3]

Chapter	Text
13.4.3.2	The STM shall request the display of an Indicator by means of the following definition: <ul style="list-style-type: none"> a) its Indicator Identifier, b) an optional Icon Identifier, c) an optional caption text, d) a Position Identifier, e) a display attribute.
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.8	Options for flashing of Indicators and Buttons (additionally to flashing mode): <ul style="list-style-type: none"> c) the frequency for slow and fast flashing; d) the flashing style either as 'yellow frame' or as 'whole area'.

1.3 Buttons

1.3.1 Diagram

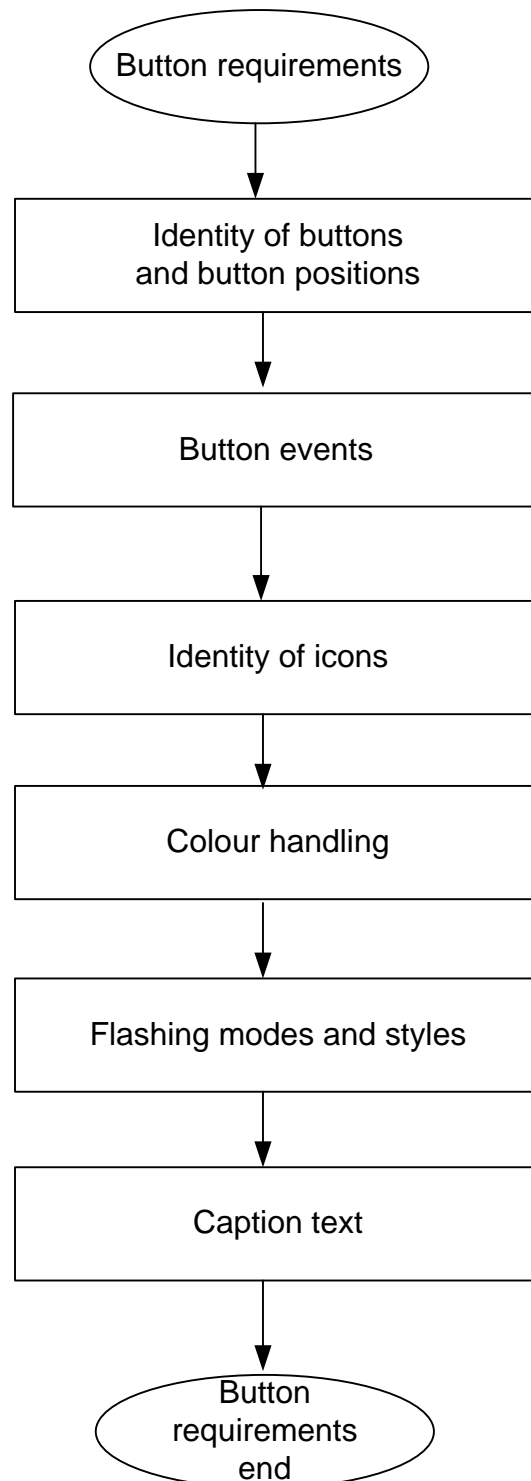


Diagram 11 – 7 c1 – Buttons main

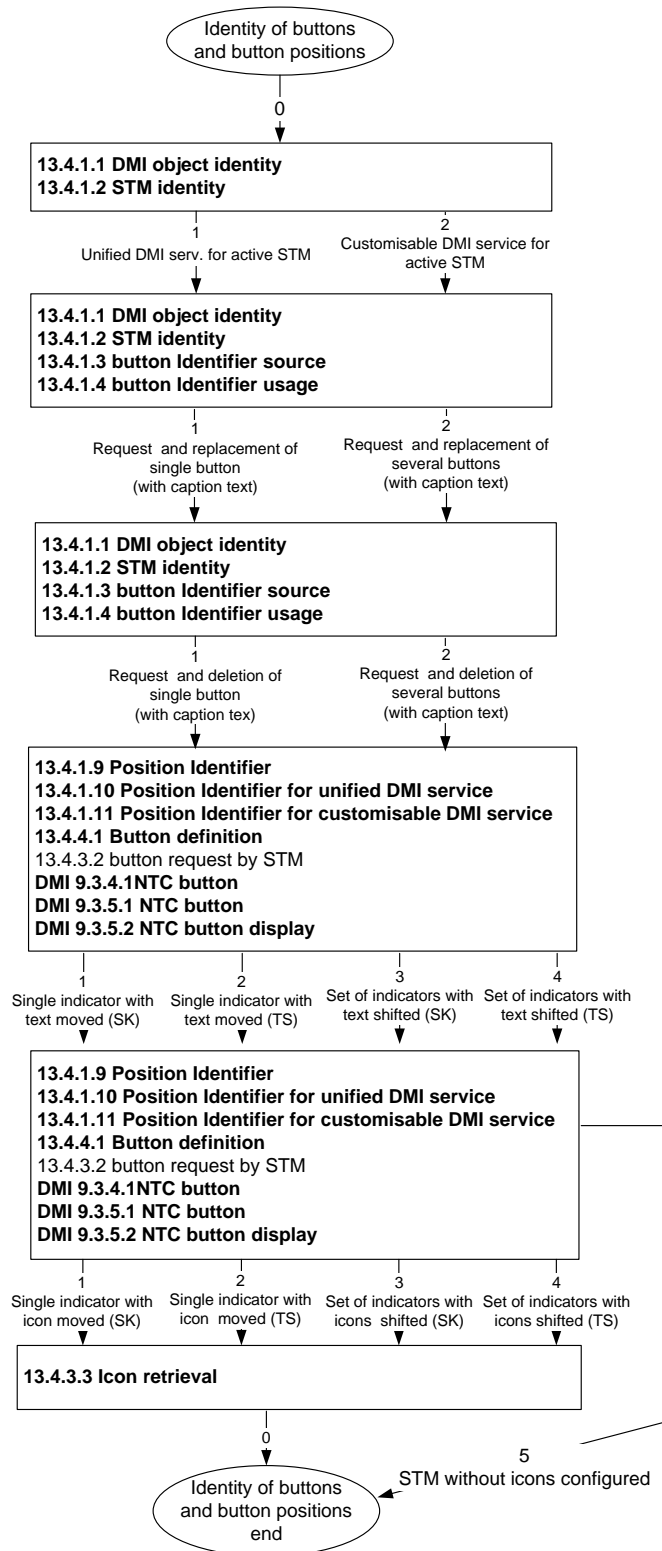


Diagram 12 – 7 c2 – Identity of buttons and button positions

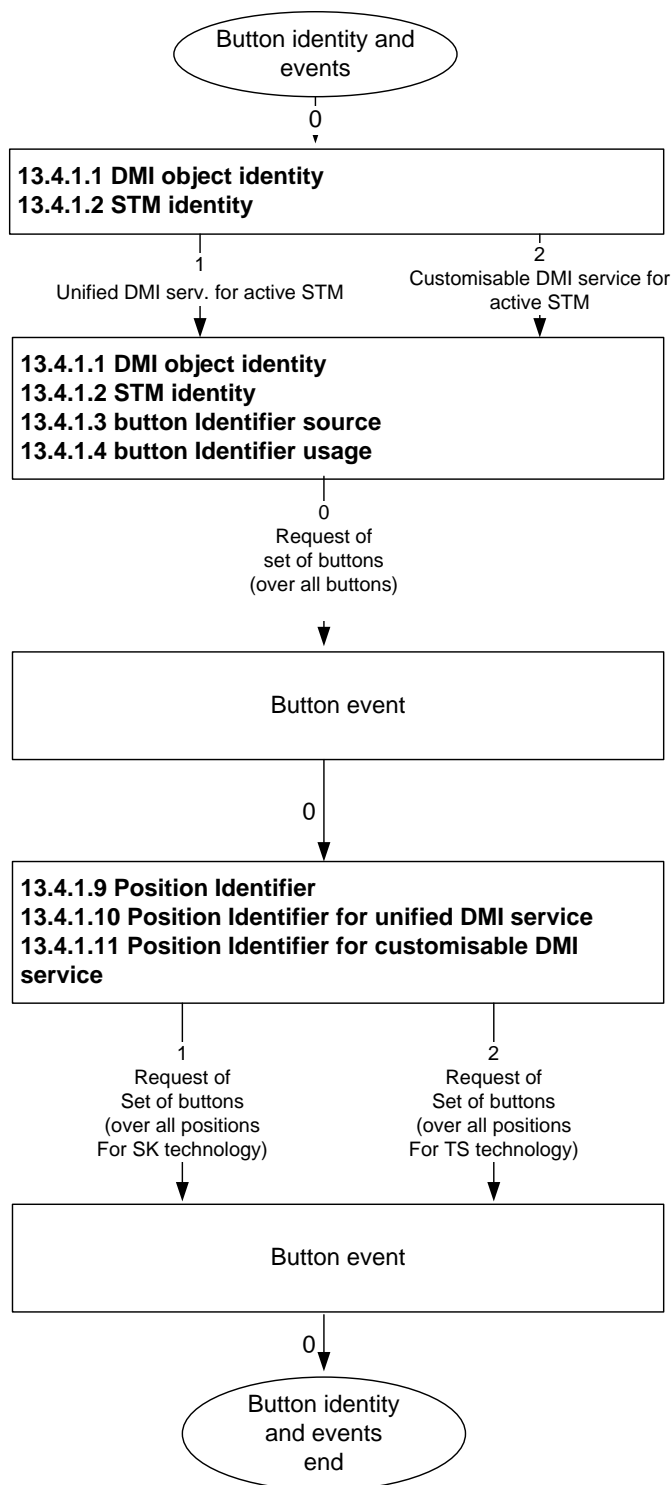


Diagram 13 – 7 c3 – Button identity and events

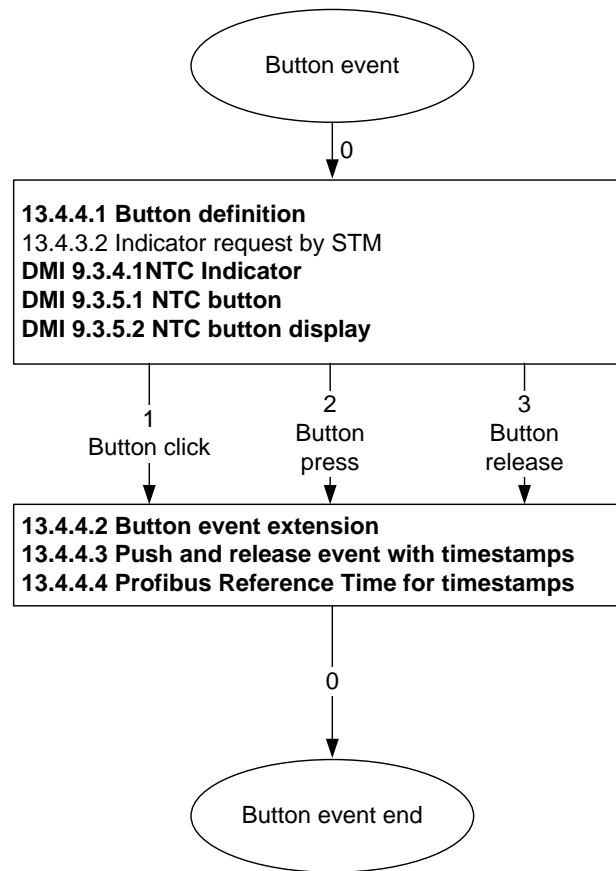


Diagram 14 – 7 c4 – Button event

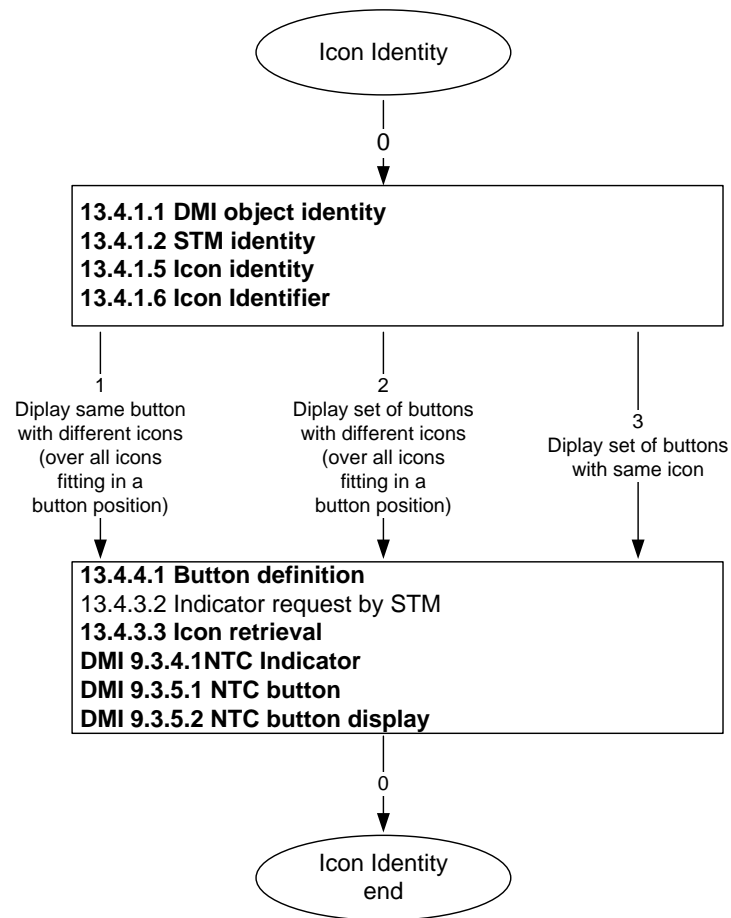


Diagram 15 – 7 c5 – Buttons: Identity of Icons

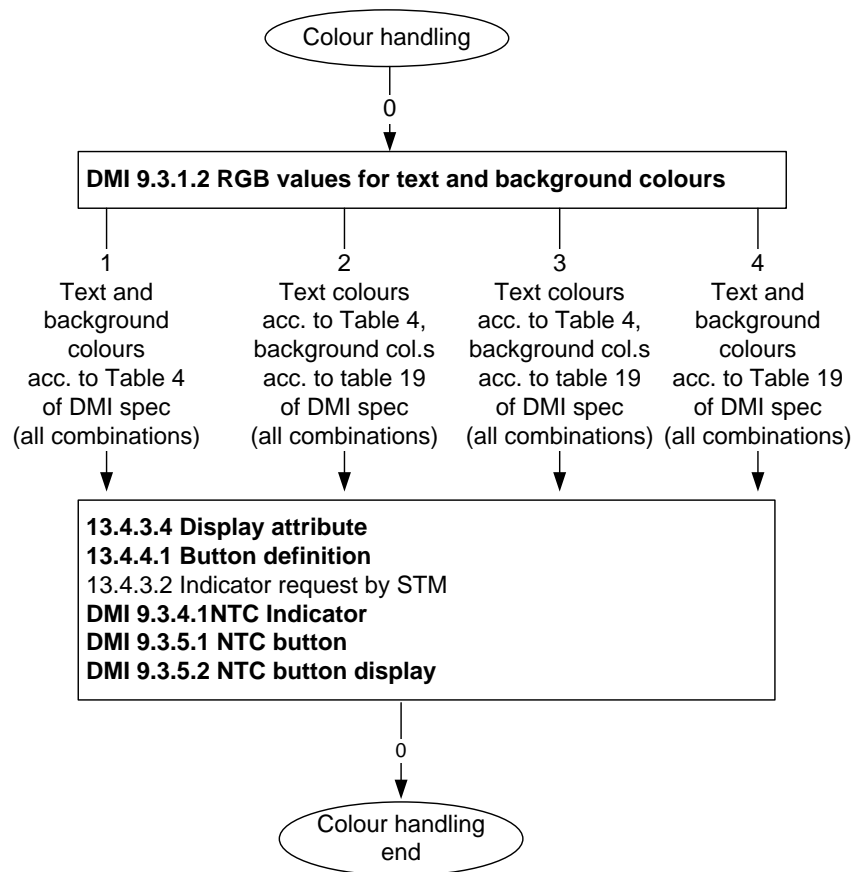


Diagram 16 – 7 c6 – Buttons: Colour handling

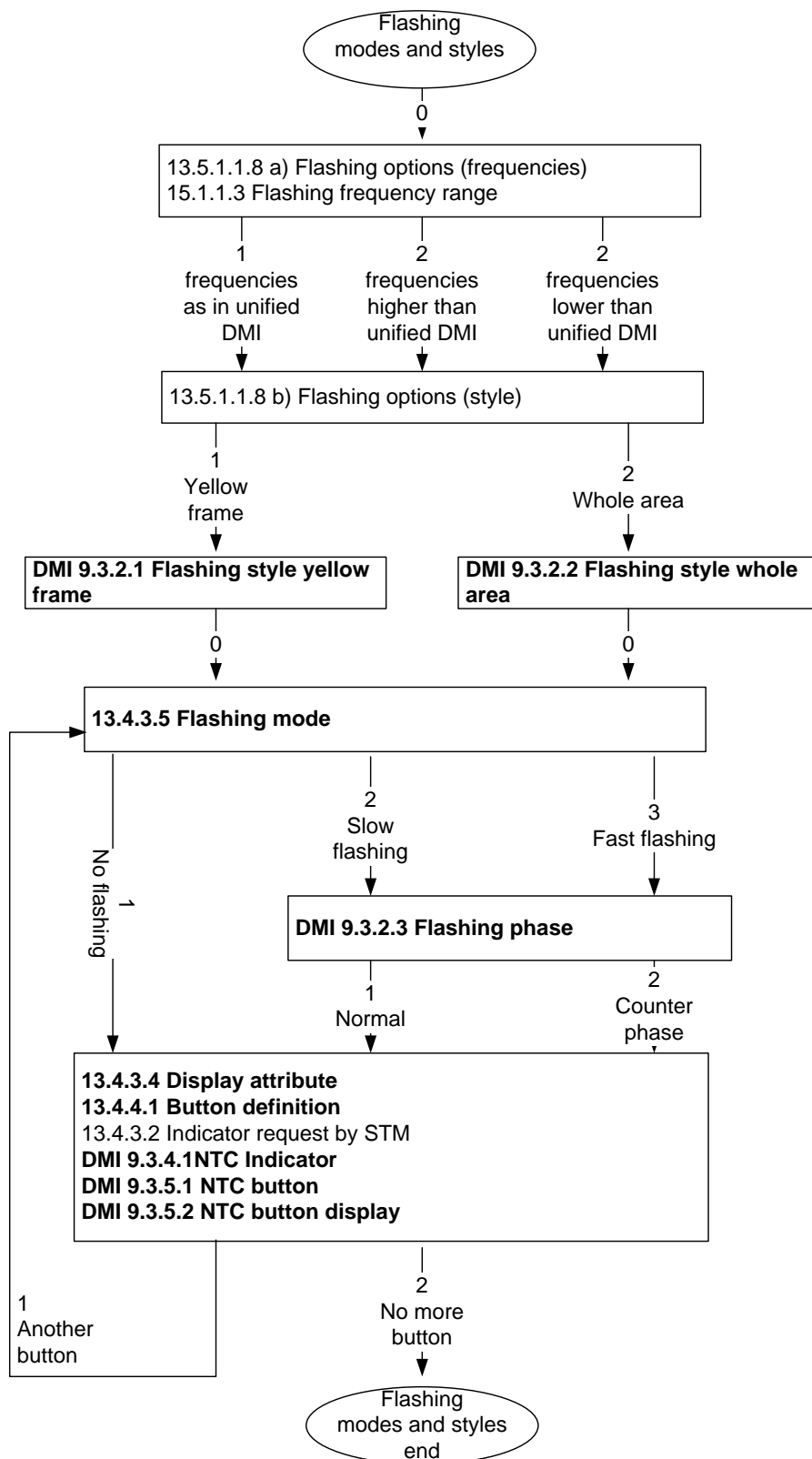


Diagram 17 – 7 c7 – Buttons: Flashing mode and style

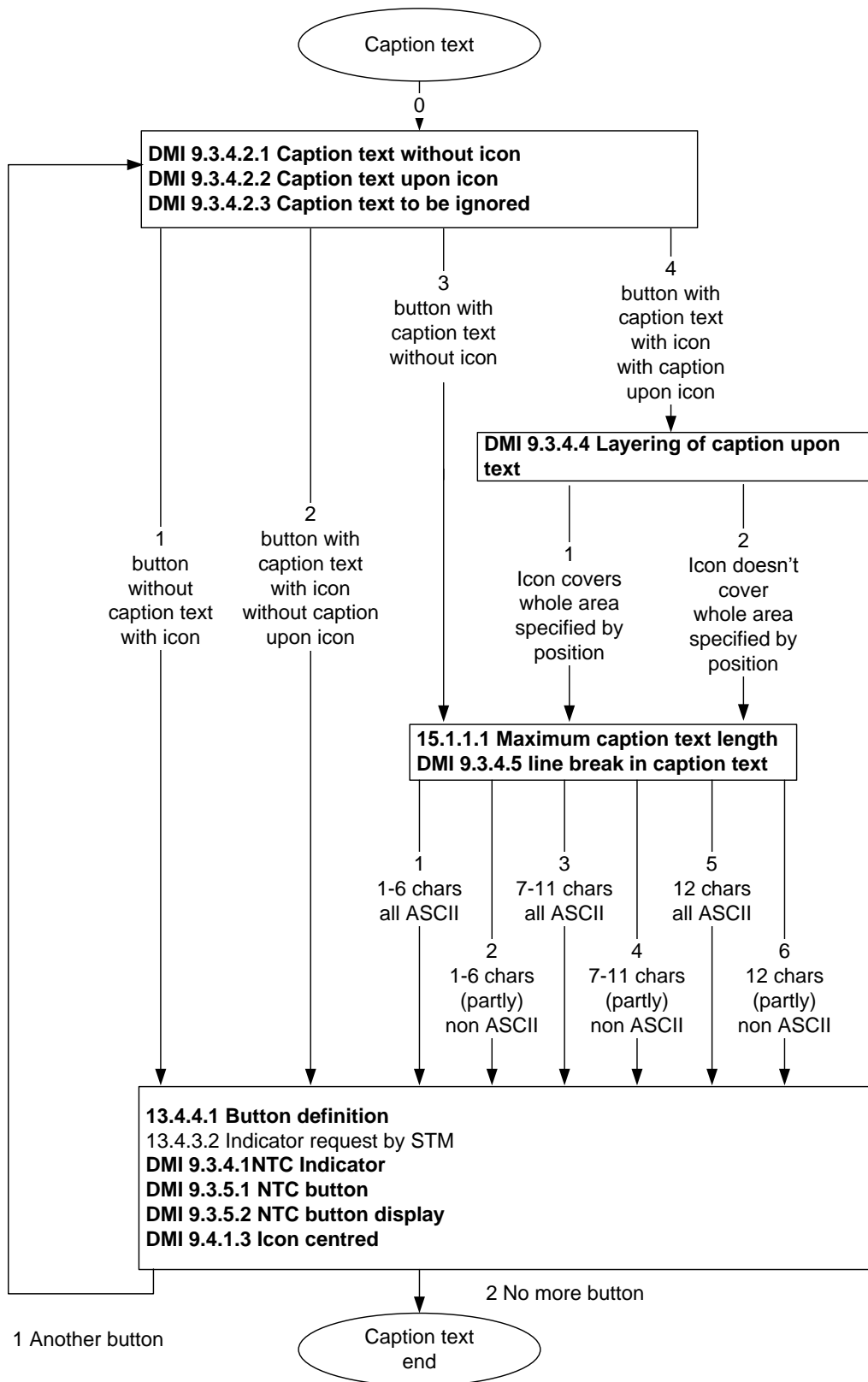


Diagram 18 – 7 c8 – Buttons: Caption text

1.3.2 Relevant requirements

1.3.2.1 ETCS DMI Specification [12]

Chapter	Text
9.3.1.2	The colours requested by the text, indicator or button attribute of a STM request shall be displayed with RGB values as specified for ETCS objects in Table 4. The additional colours not specified for ETCS objects shall be displayed with the RGB values in Table 19.
9.3.2.1	When flashing style 'yellow frame' is selected, each NTC indicator or button requested to flash by the STM shall be surrounded by a flashing frame as specified in 5.1.1.3.1.
9.3.2.2	When flashing style 'whole area' is selected, each NTC indicator or button requested to flash by the STM shall toggle between visible and not visible state (i.e. the dark blue background colour).
9.3.2.3	Flashing of different objects shall be synchronised: all objects with normal flashing mode and the same frequency shall be in the same state at the same time ; objects with counterphase flashing shall be in the alternative state at this time.
9.3.4.1	An NTC indicator can display text and/or an icon. Its state may change by changing the contained text, icon, text colour, text background colour or flashing mode. Additionally its position may change.
9.3.4.2.1	The caption text shall always be visible when no icon is requested by the STM.
9.3.4.2.2	If the STM uses the customisable DMI, the caption text shall also be visible, if "display of text upon icon" is requested as corresponding icon attribute in the configuration data.
9.3.4.2.3	Otherwise the caption text shall be ignored by the ERTMS/ETCS on-board.
9.3.4.3	An indicator shall be displayed according to the display attribute sent with the indicator Request.
9.3.4.4	If both the caption text and the icon are displayed, the layering shall be text in foreground, icon in middle layer and background colour in background.
9.3.4.5	The part of the caption text from the seventh character shall be displayed on a second Line.
9.3.5.1	Buttons are a pure functional extension of Indicators. All requirements of chapter 9.3.4 shall apply to buttons, by replacing "indicator" with "button".
9.3.5.2	The ERTMS/ETCS-onboard shall display NTC buttons pressed and not pressed like ETCS buttons.
9.4.1.3	The customisable DMI service shall display icons centred in the specified area.

1.3.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.4.1.1	The DMI objects indicators and buttons used by the different STMs are assigned a unique object identity made of NID_STM and Indicator/Button Identifier.
13.4.1.2	The STM Identity is implicitly provided by the STM by its announced NID_STM (and repeated in each message header according to the language).
13.4.1.3	The Indicator/Button Identifier is provided by the STM as part of the corresponding Indicator/Button request.
13.4.1.4	The Indicator/Button Identifier is used by the STM to be able to change the state of objects and to move or remove them. The Button Identifier is also

	used by the ERTMS/ETCS on-board to transmit the button events to the STM. If the customisable DMI service is used, it is also used to define the properties of the object.
13.4.1.5	All icons (bitmap symbols) used by the different STMs using a customisable DMI are assigned an icon identity made of NID_STM and Icon Identifier.
13.4.1.6	An Icon Identifier can be provided by the STM as part of the corresponding Indicator/Button request.
13.4.1.9	For specifying the position of DMI objects, Position Identifiers are used.
13.4.1.10	If the unified DMI service is used, the Position Identifier specifies an area of the ETCS layout as defined in [12].
13.4.1.11	If the customisable DMI service is used, the Position Identifier and the NID_STM are used to define the position in cell coordinates and size as specified in the configuration data for this STM.
13.4.3.3	The Icon Identifier shall be used by the DMI Function in case of the customisable DMI service to retrieve from the configuration data the corresponding icon attached to an Indicator/Button object.
13.4.3.4	The display attribute shall specify the background colour and the flashing mode for the whole Indicator and the display colour of the caption text.
13.4.3.5	The flashing mode specifies if the slow, fast or no flashing and if normal or counterphase flashing shall be used
15.1.1.1	The maximum number of characters (coded in UTF-8 by 1 or 2 bytes) to display shall be b) 12 characters for button and indicator caption text in button and indicator requests.
13.4.4.1	Buttons are a pure functional extension of Indicators. All requirements of chapter 13.4.3 shall apply to Buttons, by replacing “Indicator” with “Button”
13.4.4.2	The extension is the transmission of Button events from the DMI Function to STM. The DMI Function shall make a distinction between push event (transition from Button not pressed to pressed state) and release event (opposite transition).
13.4.4.3	The DMI Function shall report Button push and release events to the STM and shall timestamp those event reports to reflect the sequence of events.
13.4.4.4	The DMI Function shall use the Reference Time (see chapter 5.2.2) for timestamping the Button events reports.

1.3.2.3 For STM from FFFIS STM specification [3]

Chapter	Text
13.4.3.2	The STM shall request the display of an Indicator by means of the following definition: a) its Indicator Identifier, b) an optional Icon Identifier, c) an optional caption text, d) a Position Identifier, e) a display attribute.
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.8	Options for flashing of Indicators and Buttons (additionally to flashing mode):



	<p>a) the frequency for slow and fast flashing;</p> <p>b) the flashing style either as 'yellow frame' or as 'whole area'.</p>
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1.4 Text messages

1.4.1 Diagram

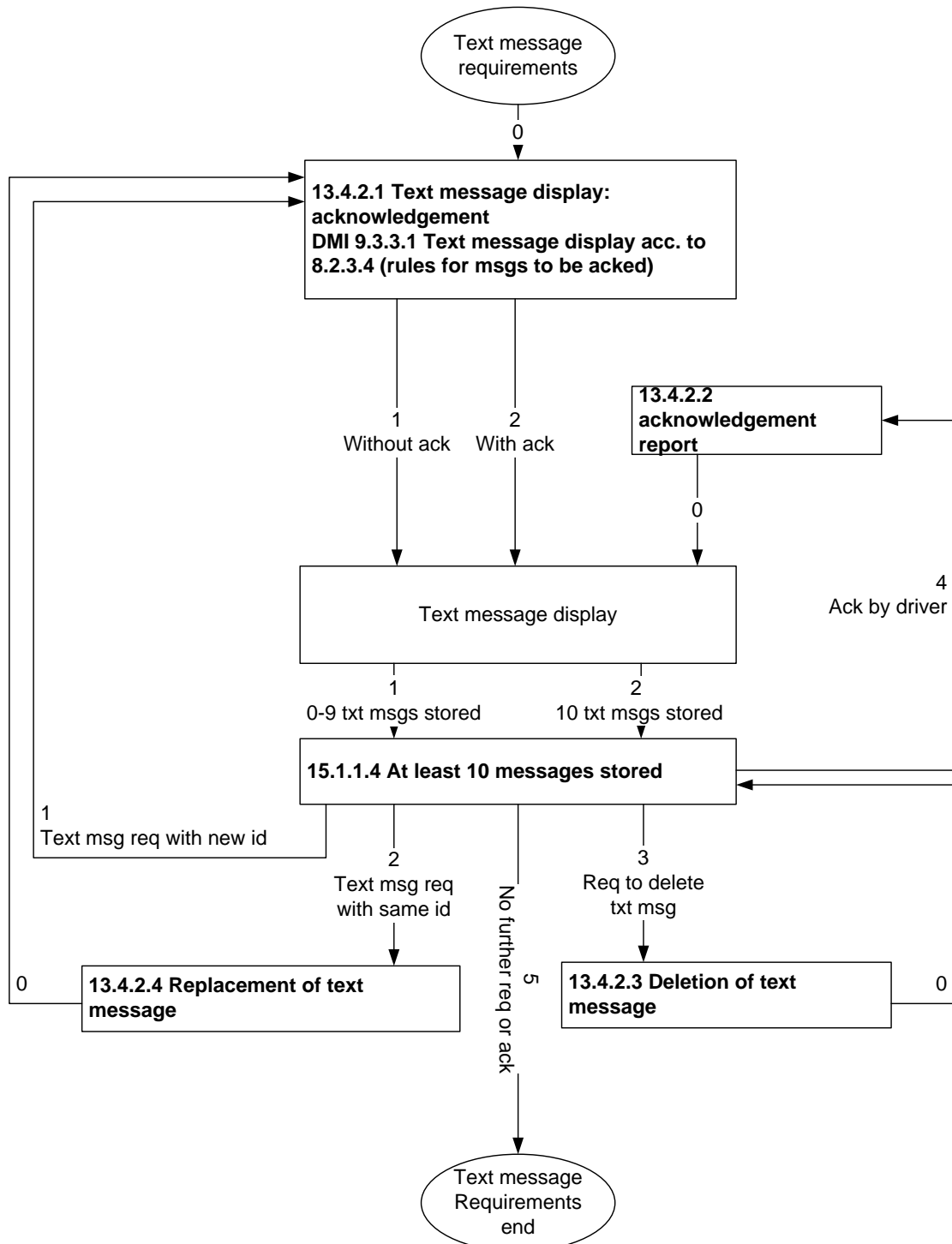


Diagram 19 – 7 d1 Text message main

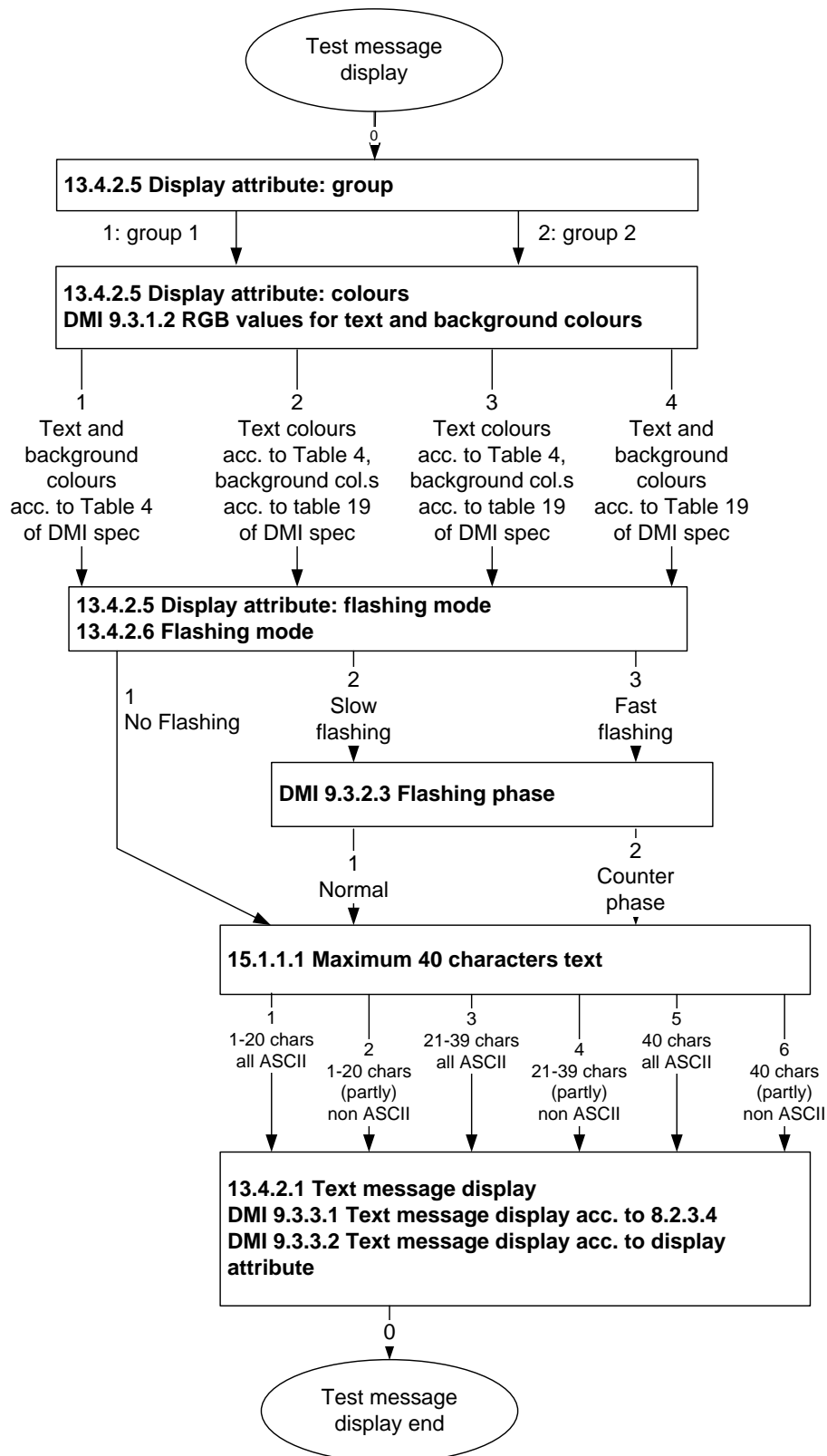


Diagram 20 – 7 d2 – Text message display

1.4.2 Relevant requirements

1.4.2.1 ETCS DMI Specification [12]

Chapter	Text
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9.3.1.2	The colours requested by the text, indicator or button attribute of a STM request shall be displayed with RGB values as specified for ETCS objects in Table 4. The additional colours not specified for ETCS objects shall be displayed with the RGB values in Table 19.
9.3.2.3	Flashing of different objects shall be synchronised: all objects with normal flashing mode and the same frequency shall be in the same state at the same time; objects with counterphase flashing shall be in the alternative state at this time.
9.3.3.1	NTC text messages shall be treated and displayed as and together with ETCS text messages, including scrolling and acknowledgment (see 8.2.3.4).
9.3.3.2	Exception: the display shall be according to the display attribute sent by the STM with the text message.

1.4.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.4.2.1	The DMI Function shall display a text message when requested by the STM. The text message request shall consist of a Text Identifier, a string of text to be shown to the driver, a display attribute and a possible request for driver acknowledgement.
13.4.2.2	The DMI Function shall report to the STM the acknowledgement of text messages (which were required to be acknowledged) from the driver referencing the corresponding Text Identifier.
13.4.2.3	The DMI Function shall delete a text message when requested by the active STM. The request shall reference the Text Identifier of the text message to be deleted.
13.4.2.4	If the STM requests a text message with the same Text Identifier as a not yet deleted text message, the ERTMS/ETCS on-board shall delete the original text message and display the new requested text message
13.4.2.5	The display attribute specifies the colour of the text, its background colour, the flashing mode and the group of text messages.
13.4.2.6	The flashing mode specifies if the slow, fast or no flashing and if normal or counterphase flashing shall be used.
15.1.1.1	The maximum number of characters (coded in UTF-8 by 1 or 2 bytes) to display shall be a) 40 characters for text messages in text message request.
15.1.1.4	The ERTMS/ETCS on-board DMI Function shall be able to store at least 10 STM text messages

1.4.2.3 For STM from FFFIS STM specification [3]

Chapter	Text

1.5 Sounds

1.5.1 Diagram

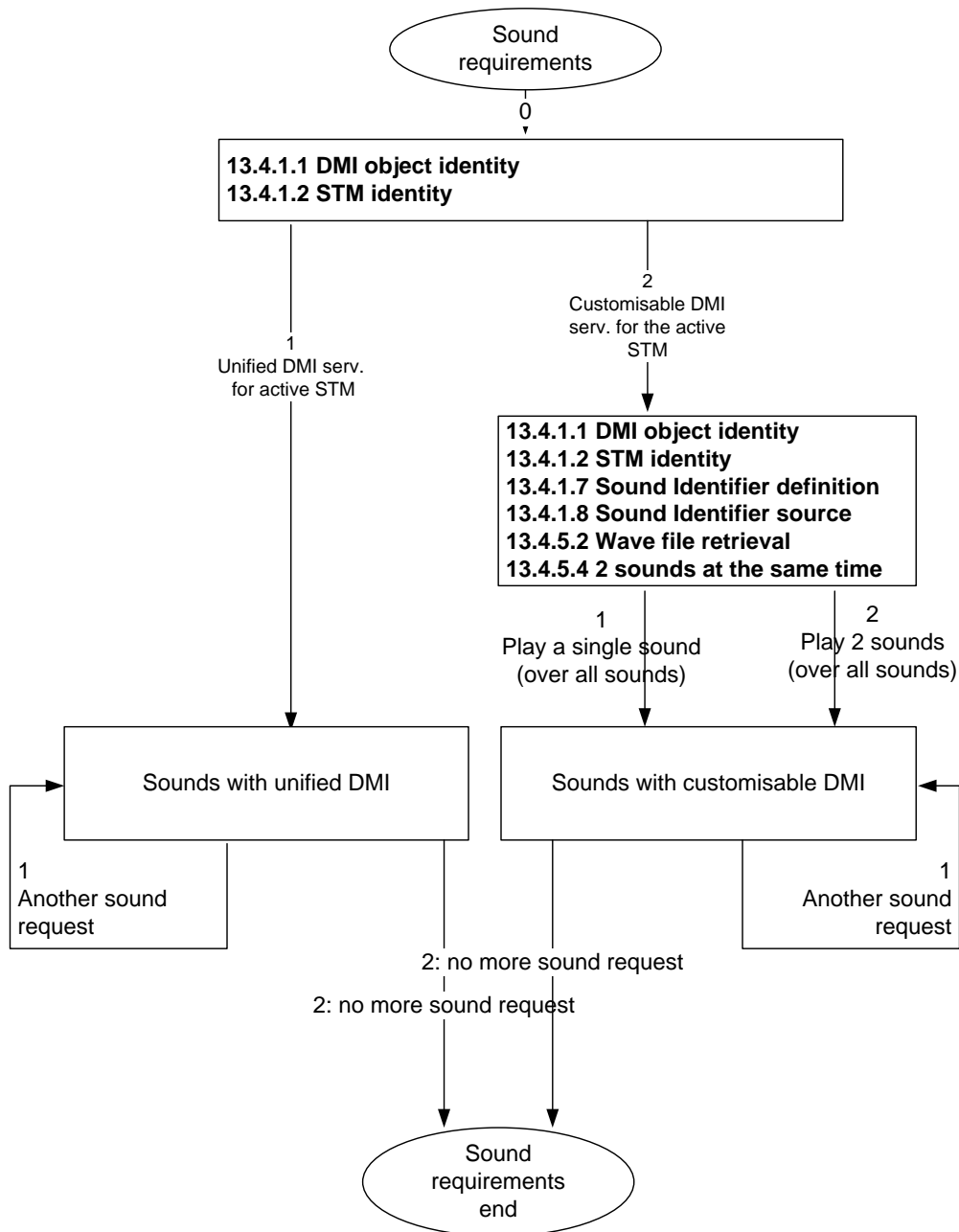


Diagram 21 – 7 e1 – Sounds main

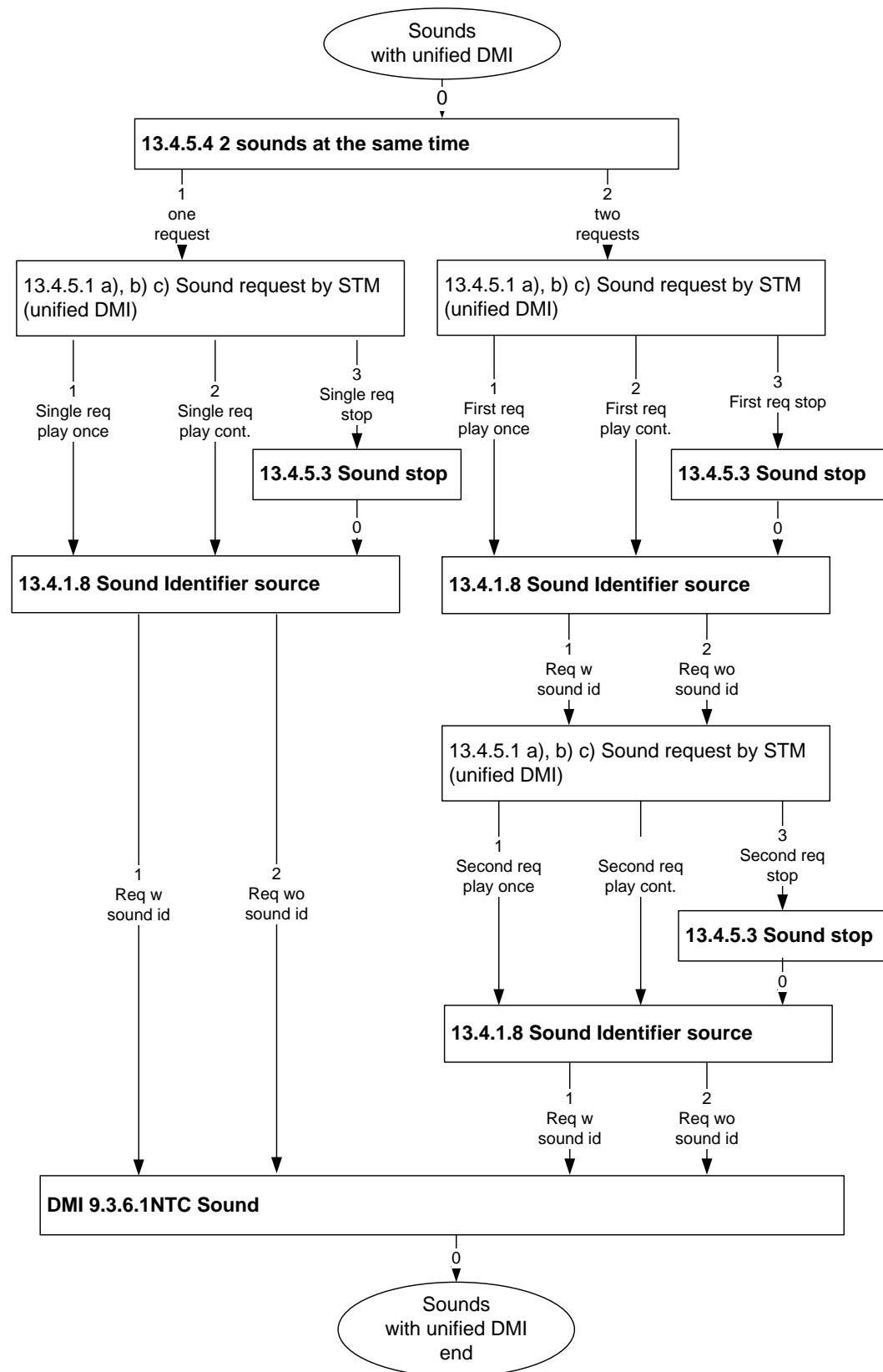


Diagram 22 – 7 e2 – Sounds with unified DMI

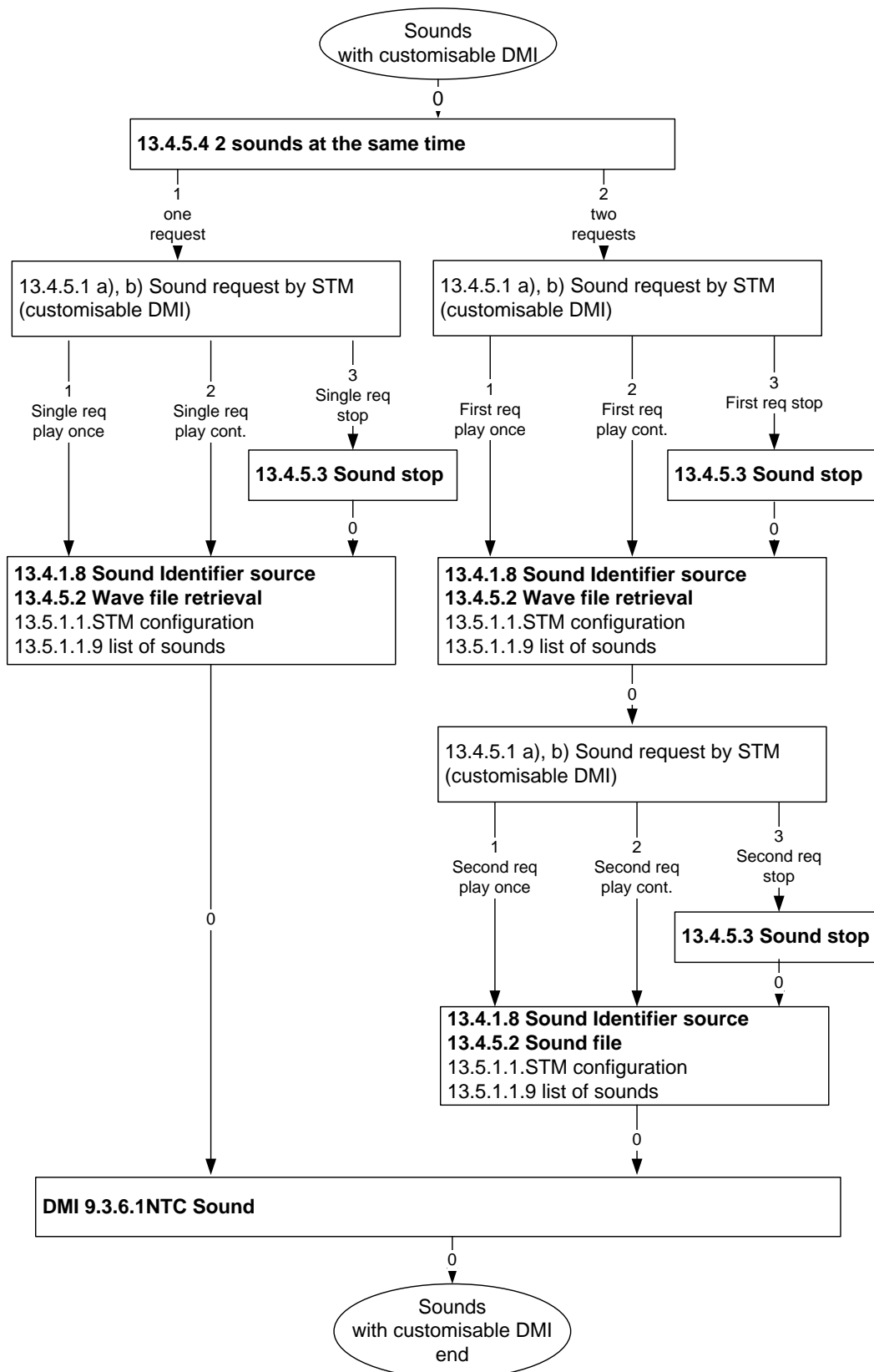


Diagram 23 – 7 e3 – Sounds with customisable DMI

1.5.2 Relevant requirements

1.5.2.1 ETCS DMI Specification [12]

Chapter	Text
9.3.6.1	A sound shall be played according to the sound definition sent in the sound requests.

1.5.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.4.1.1	The DMI objects indicators and buttons used by the different STMs are assigned a unique object identity made of NID_STM and Indicator/Button Identifier.
13.4.1.2	The STM Identity is implicitly provided by the STM by its announced NID_STM (and repeated in each message header according to the language).
13.4.1.7	All sounds (wave form for audible information) used by the different STMs using a customisable DMI are assigned a unique sound identity made of NID_STM and Sound Identifier.
13.4.1.8	A Sound Identifier can be provided by the STM as part of the corresponding sound request.
13.4.5.2	The Sound Identifier shall be used by the ERTMS/ETCS on-board in case of the customisable DMI service to retrieve from the configuration data the corresponding sound.
13.4.5.3	The Sound Identifier shall be used by the ERTMS/ETCS on-board in both DMI services to stop the generation of a Sound, if requested by the STM.
13.4.5.4	The DMI Function shall be able to manage two STM requests for Sounds at the same time.

1.5.2.3 For STM from FFFIS STM specification [3]

Chapter	Text
13.4.5.1	STM shall request a Sound by means of the following definition: a) an optional Sound Identifier, b) only in case of a unified DMI and a Sound to be generated, a sequence of segments defined by a duration and an associated frequency c) an indication if the Sound has to be repeated continuously or not or to be stopped.
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.9	The list of Sounds defined for the STM and, for each sound, its Sound definition. a) identifier (a number); b) sound, as WAV file (according to Microsoft WAV file format);

1.6 Supervision information

1.6.1 Diagram

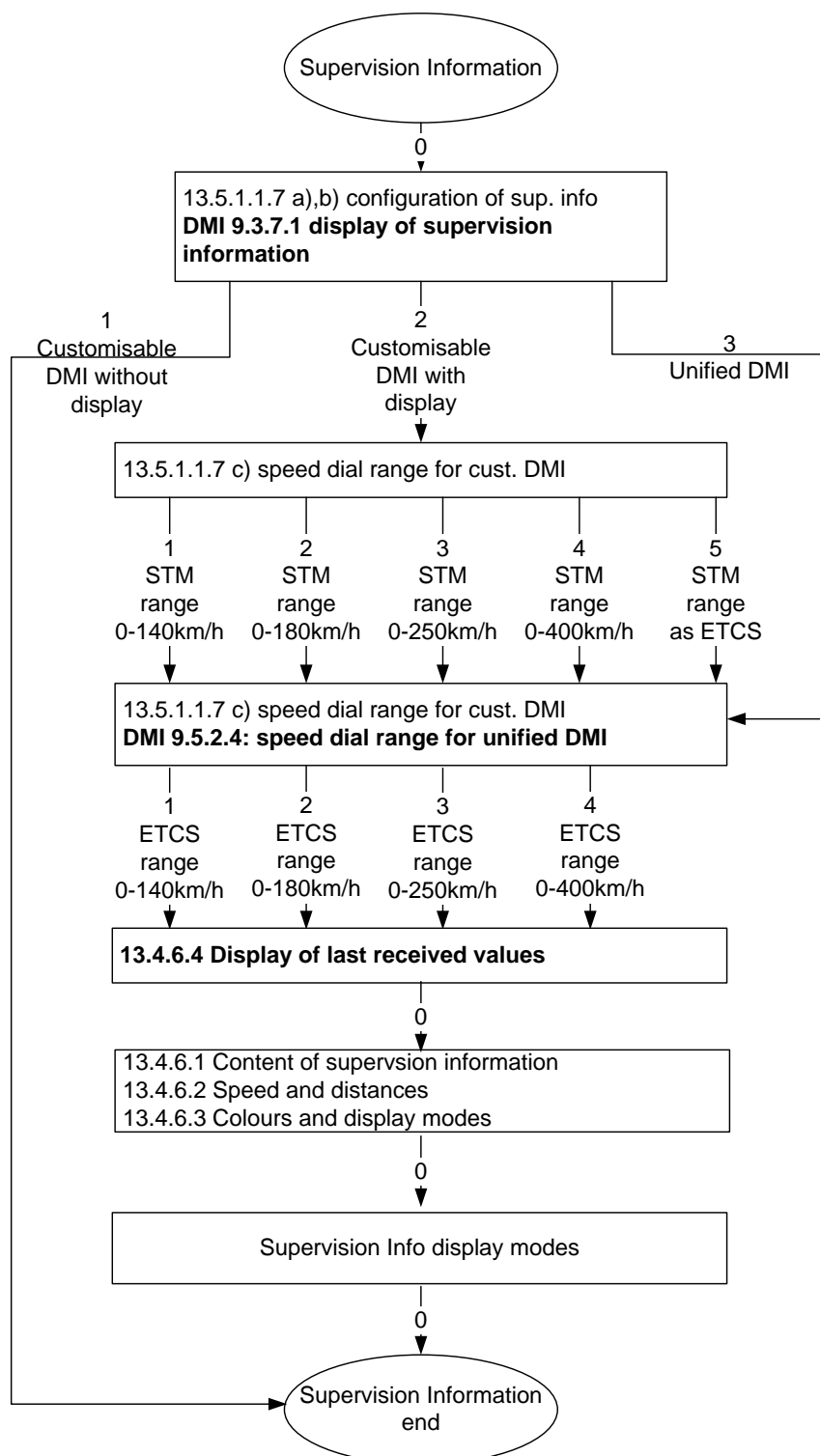


Diagram 24 – 7 f1 – Supervision Info Main

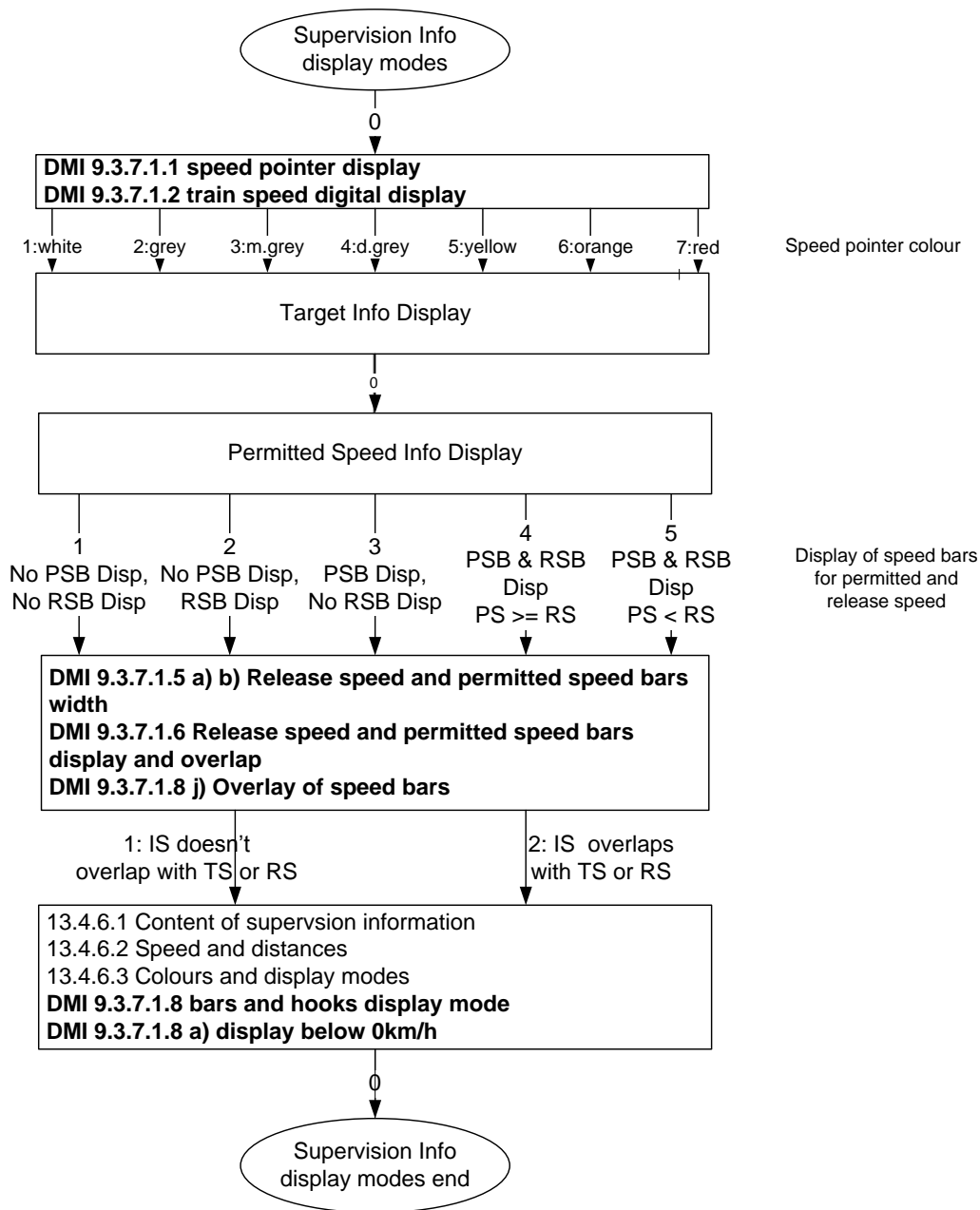


Diagram 25 – 7 f2 – Supervision Info Display Modes

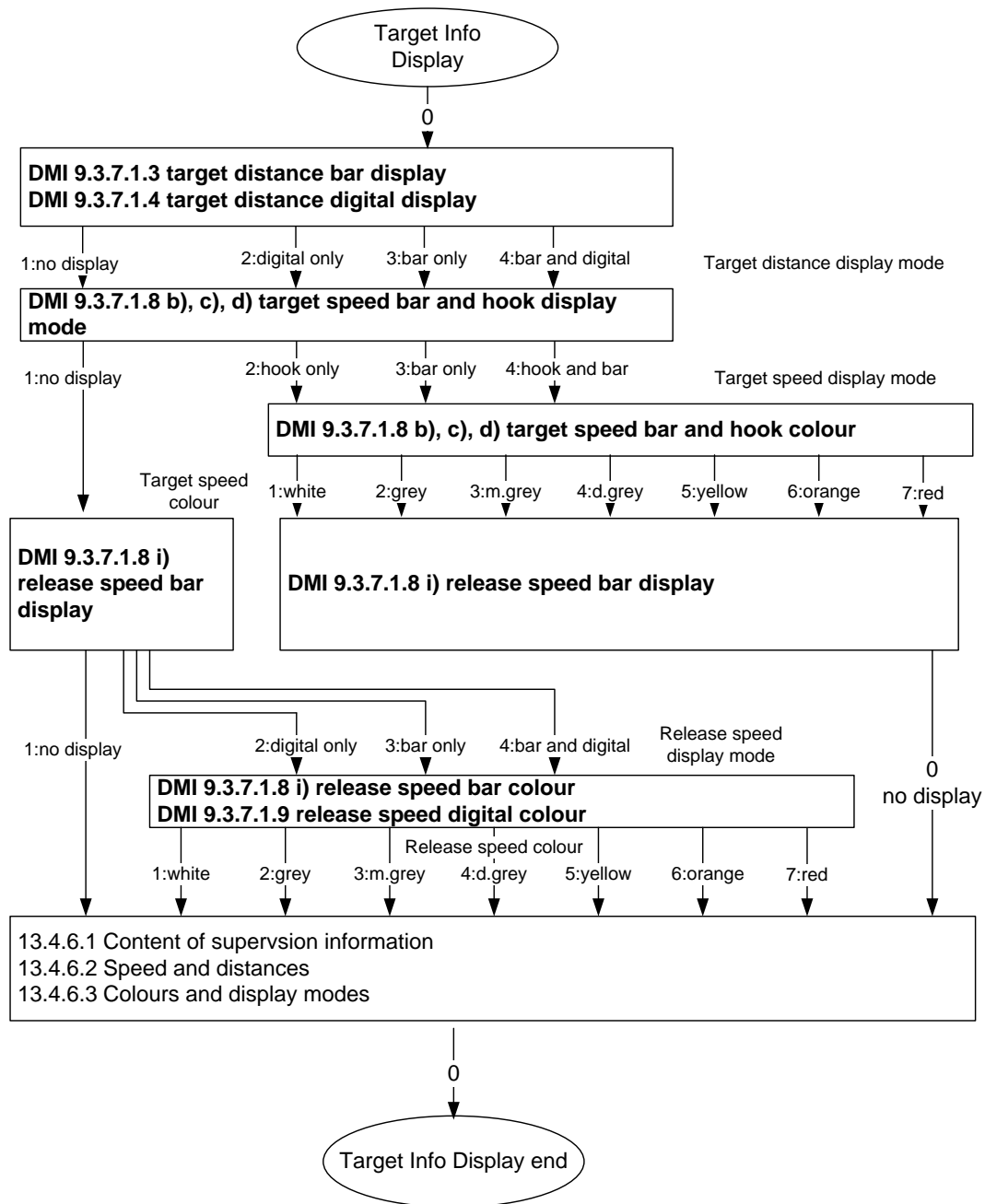


Diagram 26 – 7 f3 – Target Info Display

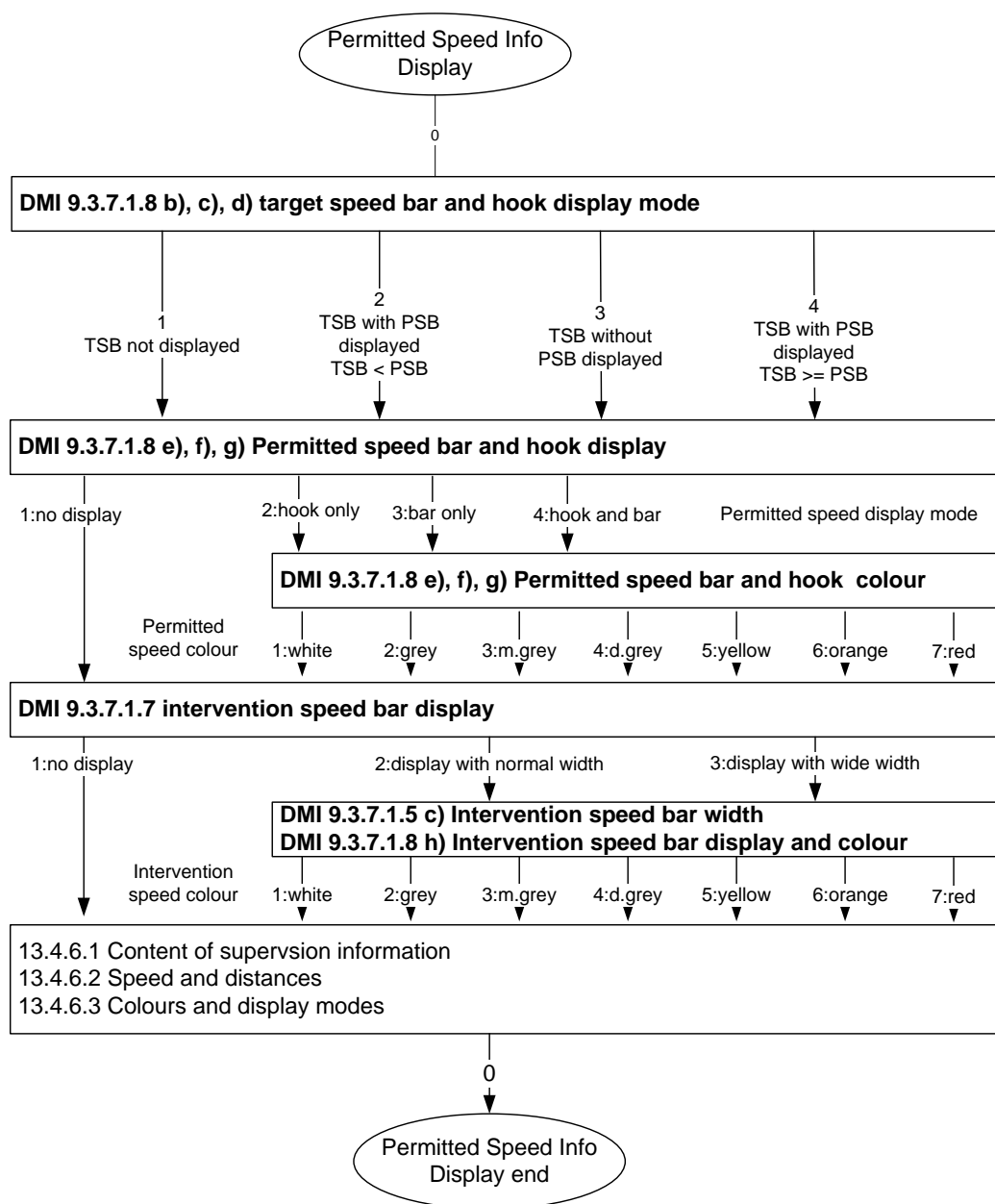


Diagram 27 – 7 f4 – Permitted Speed Info Display

1.6.2 Relevant requirements

1.6.2.1 ETCS DMI Specification [12]

Chapter	Text
9.3.7.1	If the STM uses the customisable DMI service and is configured to display such information or it uses the unified DMI service, the speed and distance supervision information sent by the STM shall be displayed by the ERTMS/ETCS on-board according to the following rules:
9.3.7.1.1	The current train speed pointer shall be displayed as specified in 8.2.1.2 but with the colour requested for it by the STM.
9.3.7.1.2	The current train speed digital shall be displayed as specified in 8.3.1.3.
9.3.7.1.3	When requested by the display mode sent by the STM, the distance to target bar shall be displayed as specified in 8.2.2.1.

9.3.7.1.4	When requested by the display mode sent by the STM, the distance to target digital shall be displayed as specified in 8.2.2.2.
9.3.7.1.5	When the supervision speeds are requested to be displayed as bars, the width of those speed bars shall be 9 cells, except for: a) the part of the permitted speed bar below a release speed bar, b) the release speed bar, c) the intervention speed bar if it is requested to display it with the “wide bar width”.
9.3.7.1.6	When a release speed bar is displayed, the permitted speed bar and the release speed bar shall be indicated applying clause 8.2.1.6.4 by analogy to the CSG.
9.3.7.1.7	When the intervention speed bar is requested to be displayed with “wide bar width”, it shall be displayed with 20 cells.
9.3.7.1.8	The speed bars and hooks shall be displayed along the speed dial in the area B2 as for the Circular speed gauge and for the Basic speed hook(s) used on the ETCS default window, except consideration of the display mode.
9.3.7.1.8 a)	a) A dark grey bar below 0km/h (-149 degrees to -144 degrees, as specified for ETCS default window) if display of any bar is requested.
9.3.7.1.8 b)	b) The target speed bar in the colour requested for target speed between permitted speed and target speed if permitted speed is displayed and is lower than target speed, otherwise between 0km/h and target speed.
9.3.7.1.8 c)	c) If the requested display mode is ‘hook only’, the target speed hook shall be displayed at the target speed as specified in 8.2.1.5.5 but with the colour requested for it by the STM.
9.3.7.1.8 d)	d) If the requested display mode is ‘hook and bar’, the target speed hook shall be displayed at the target speed as specified in 8.2.1.4.7 but with the colour requested for it by the STM.
9.3.7.1.8 e)	e) The permitted speed bar in the colour requested for permitted speed between target speed and permitted speed if target speed is displayed and is lower than permitted speed, otherwise between 0km/h and permitted speed, if no target speed is displayed. The permitted speed bar may overlap with the release speed bar.
9.3.7.1.8 f)	f) If the requested display mode is ‘hook only’, the permitted speed hook shall be displayed at the permitted speed as specified in 8.2.1.5.4 but with the colour requested for it by the STM.
9.3.7.1.8 g)	g) If the requested display mode is ‘hook and bar’, the permitted speed hook shall be displayed at the permitted speed as specified in 8.2.1.4.7 but with the colour requested for it by the STM.
9.3.7.1.8 h)	h) The intervention speed bar between permitted speed and intervention speed in the colour requested for intervention speed.
9.3.7.1.8 i)	i) The release speed bar between 0km/h and release speed, possibly overlapping with permitted speed bar in the colour requested for the release speed.
9.3.7.1.8 j)	j) The order of superimposing objects on top of the background from back to front is: intervention speed bar, target speed bar/hook, permitted speed bar/hook, release speed bar.
9.3.7.1.9	The release speed digital display shall be displayed in the colour requested for the release speed.
9.5.2.4	The ERTMS/ETCS on-board shall display the NTC supervision information using the same range for the speed dial as for ETCS supervision information

1.6.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
13.4.6.4	The DMI Function shall use the last received information for Current train speed pointer, Target Speed, Release Speed, Permitted Speed, Intervention Speed and Target Distance

1.6.2.3 For STM from FFFIS STM specification [3]

Chapter	Text
13.4.6.1	There shall be two sets of supervision information: a) Speed and distance values b) Colours and display modes
13.4.6.2	Speed and distance values consists of : a) Permitted Speed b) Target Speed c) Target Distance d) Release Speed e) Intervention Speed
13.4.6.3	Colours and display modes consists of: a) Current train speed pointer <ul style="list-style-type: none"> • Colour b) Permitted Speed <ul style="list-style-type: none"> • Colour • Display mode: no display, bar only, hook only or hook and bar c) Target Speed <ul style="list-style-type: none"> • Colour • Display mode: no display, bar only, hook only or hook and bar d) Target Distance <ul style="list-style-type: none"> • Display mode: no display, bar only, digital only or bar and digital e) Release Speed <ul style="list-style-type: none"> • Colour • Display mode: no display, bar only, digital only or bar and digital f) Intervention Speed <ul style="list-style-type: none"> • Colour • Display mode: no display, display with normal bar width or display with wide bar width
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.7	ETCS speed and distance supervision

	<ul style="list-style-type: none">a) For speed and distance supervision display in speed dial as for ETCS in area B0-B2, B6 and A2-A3 (applicable as long as the STM is active):b) Yes/No; “Yes” means that the ETCS train speed display is re-used as such together with the supervision information as specified in 13.4.6. “No” means that there is no display of speed and distance supervision in the ETCS way.c) if Yes: speed dial range (0-140/180/250/400 km/h or same range as ETCS).
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1.7 Moved ETCS areas

1.7.1 Diagram

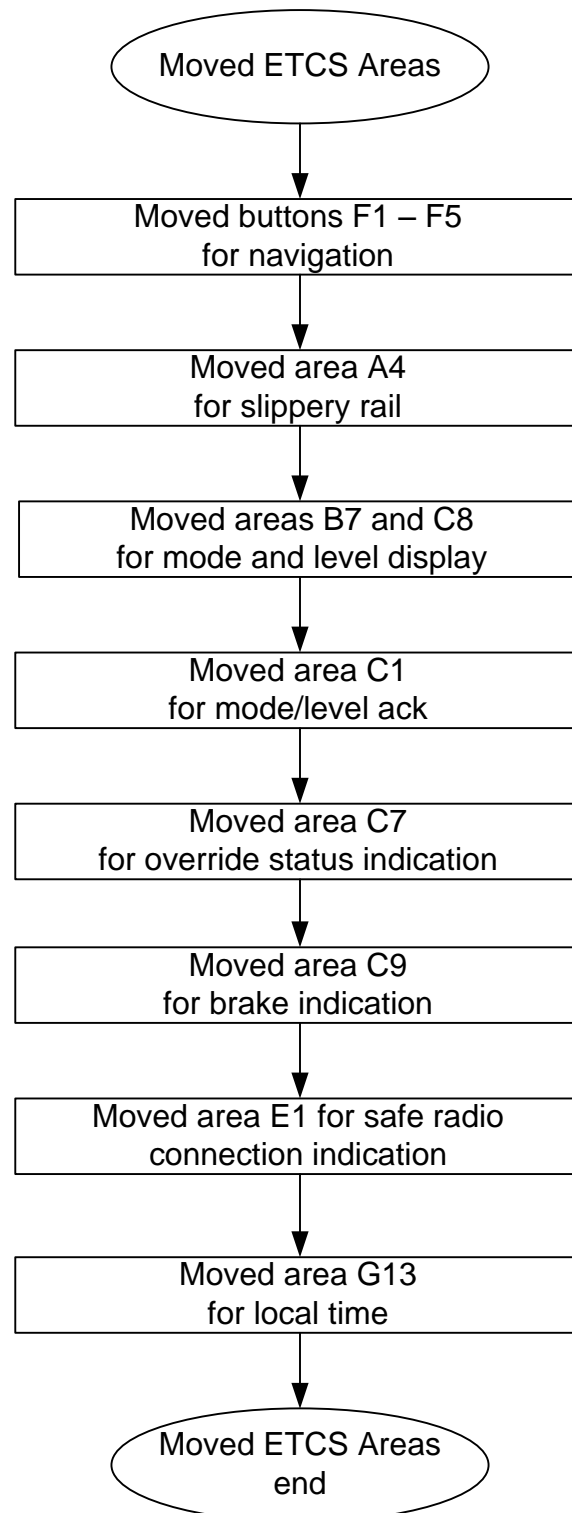


Diagram 28 – 7 g1 – Moved ETCS Areas Main

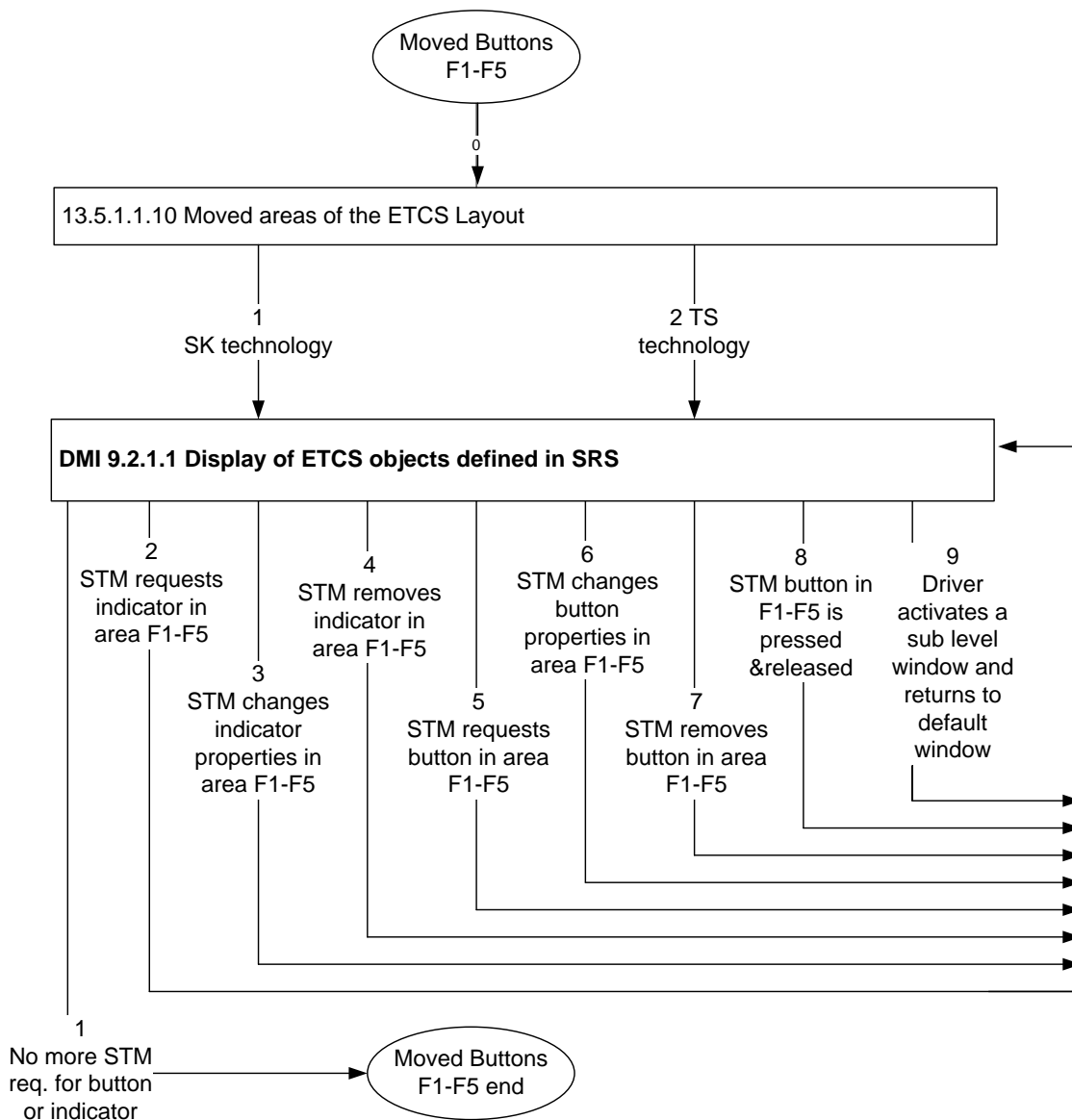


Diagram 29 – 7 g2 – Moved Areas F1-F5

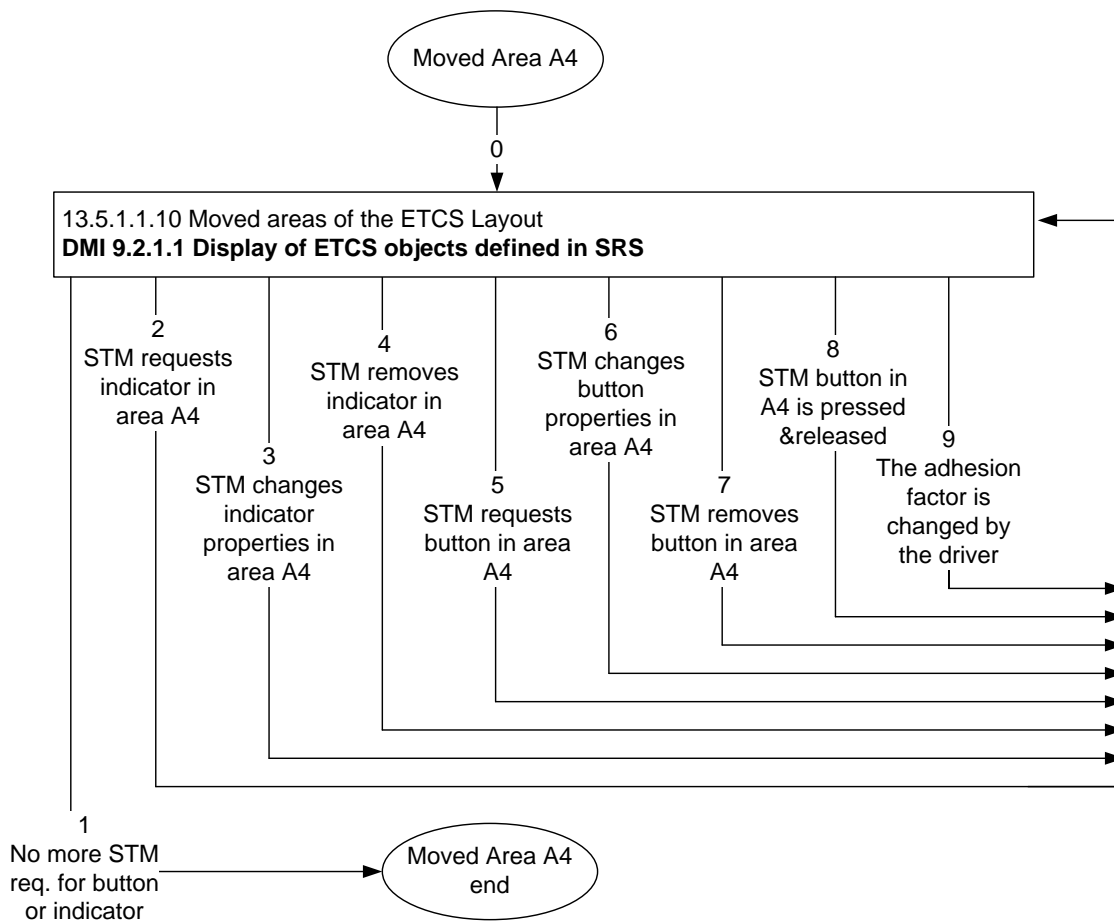


Diagram 30 – 7 g3 – Moved Area A4

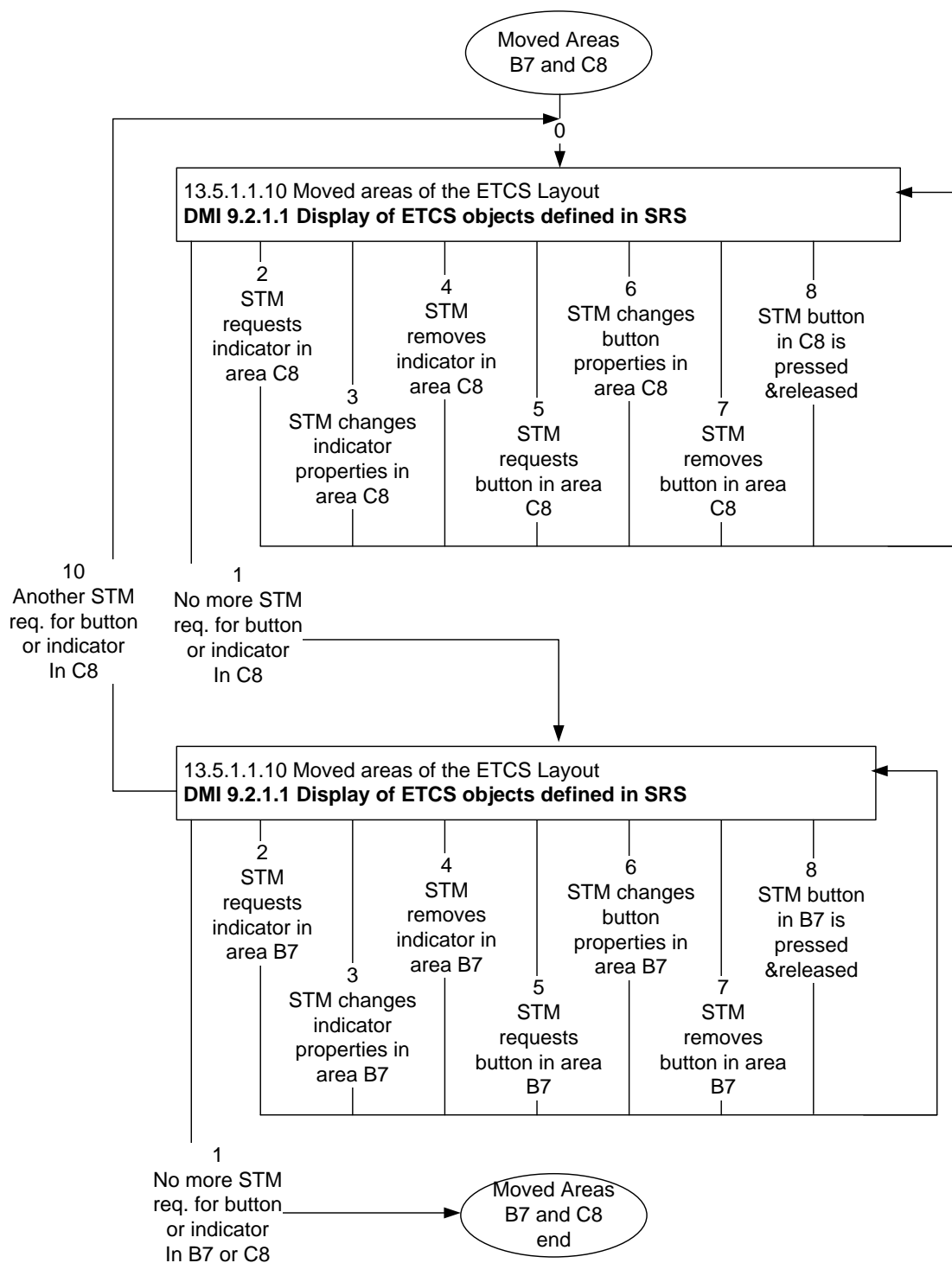


Diagram 31 – 7 g4 – Moved Areas B7 and C8

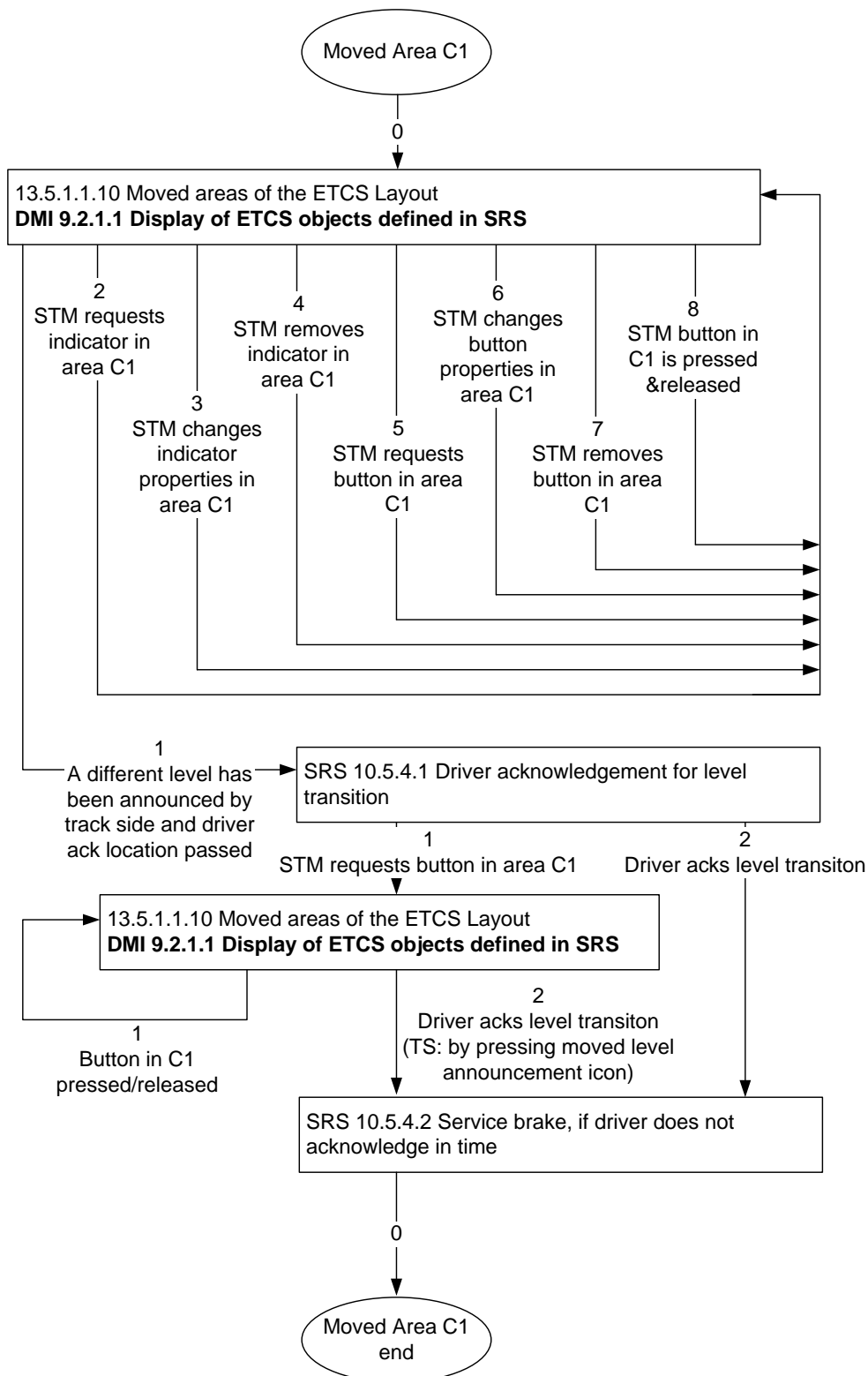


Diagram 32 – 7 g5 – Moved Area C1

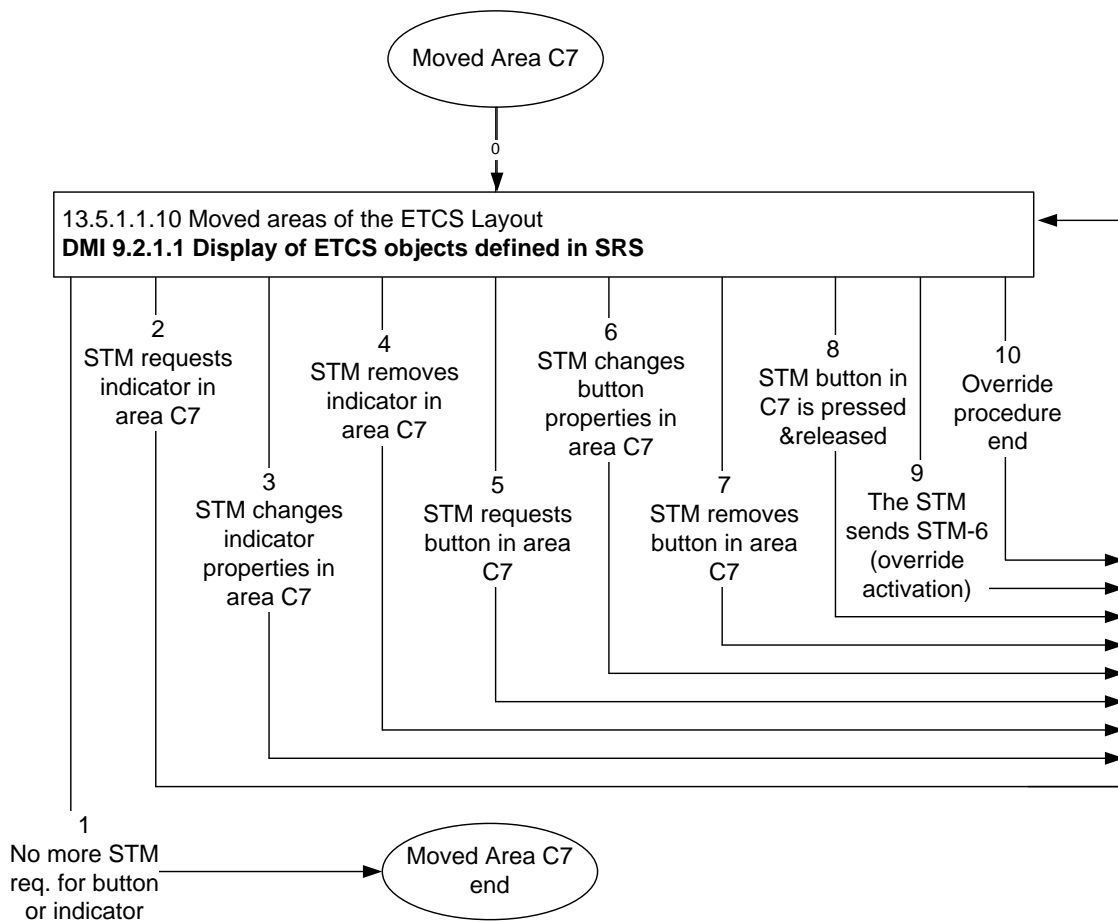


Diagram 33 – 7 g6 – Moved Area C7

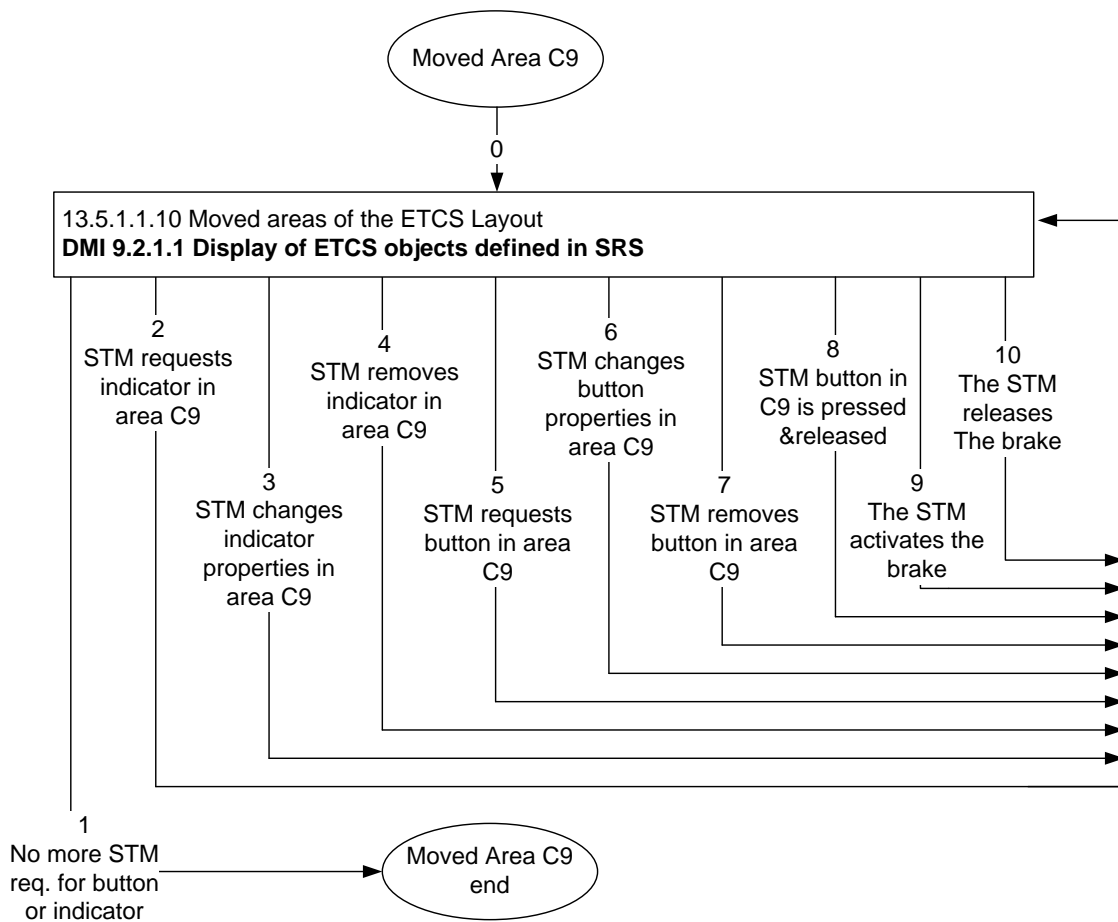


Diagram 34 – 7 g7 – Moved Area C9

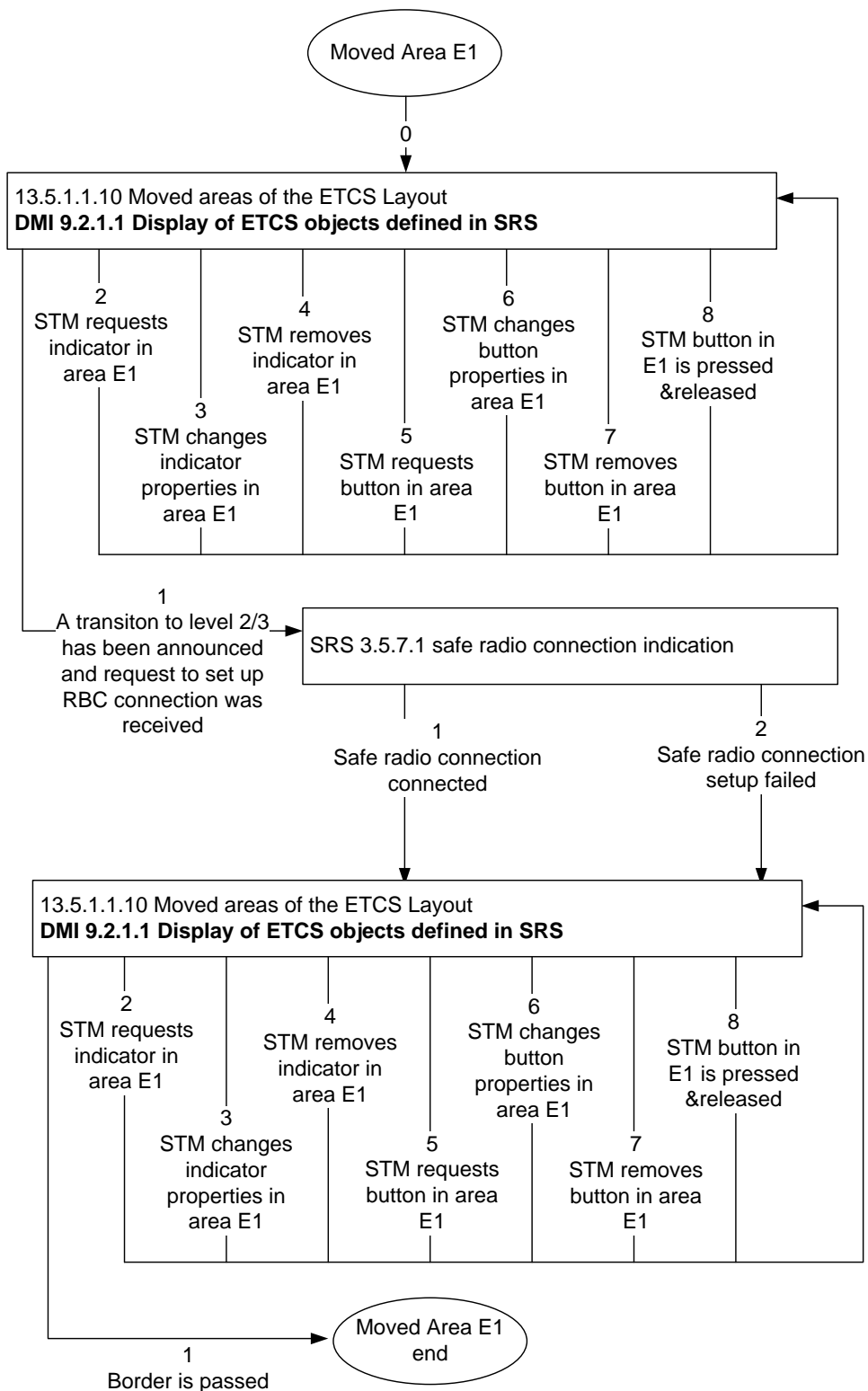


Diagram 35 – 7 g8 – Moved Area E1

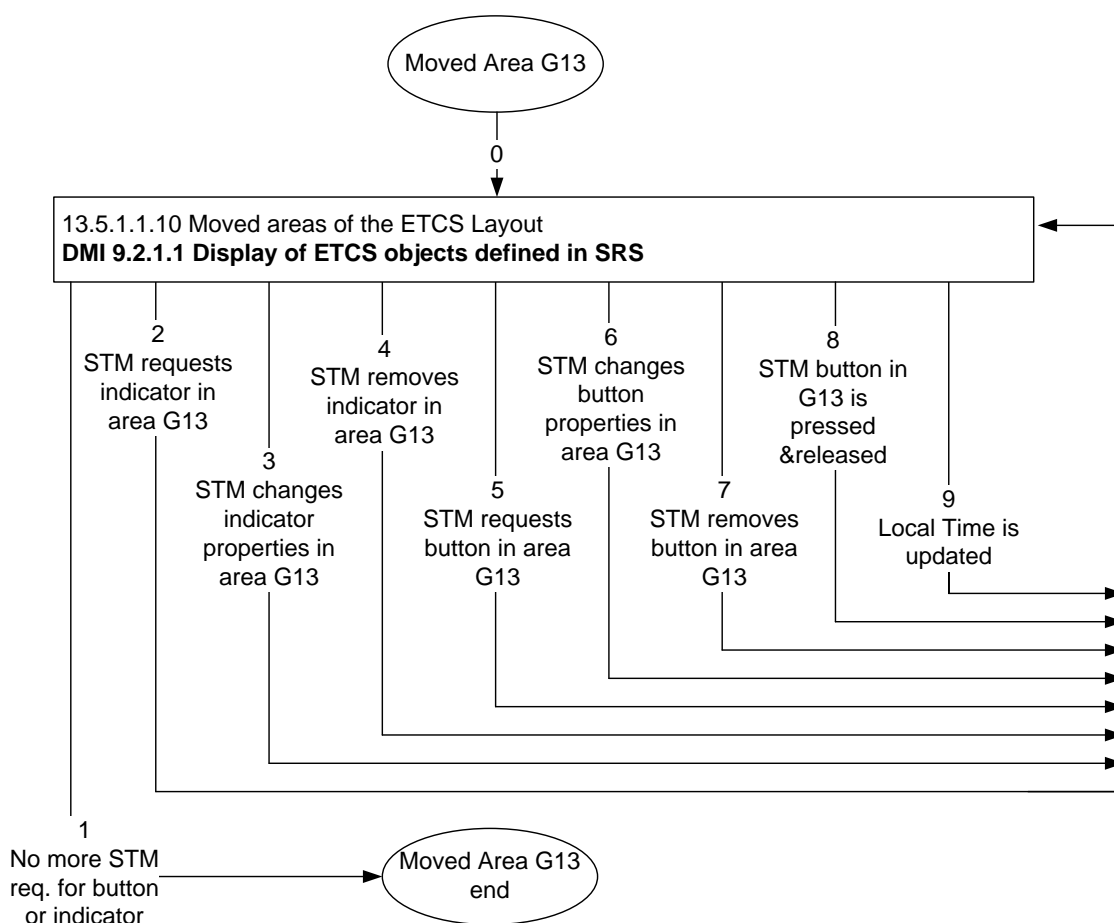


Diagram 36 – 7 g9 – Moved Area G13

1.7.2 Relevant requirements

1.7.2.1 SRS [2]

Chapter	Text
3.5.7.1	The ERTMS/ETCS on-board equipment shall inform the driver about the status of the safe radio connection. To that purpose, the following indication statuses of the safe radio connection are defined: “No Connection”, “Connection Lost/Set-Up failed”, “Connection Up”.
5.10.4.1	If defined so for the level transition (see table below), the driver shall be requested to acknowledge the transition <ul style="list-style-type: none"> a) when the max safe front end of the train has passed a trackside defined location in rear of the level transition border b) upon receipt of the order to switch to the new level immediately.
5.10.4.2	If the driver has not yet acknowledged within the driver acknowledgement time (refer to Appendix A3.1) after the level transition, a service brake command shall be initiated.

1.7.2.2 ETCS DMI Specification [12]

Chapter	Text
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9.2.1.1	The ETCS objects/functions in document [3] chapter 4.7.2, modes SN and NL shall be displayed as far as they concern a default window, i.e. the appearance shall be as specified in chapter 8 but the location of the ETCS objects/functions will be according to the definition of the NTC default window of the corresponding National System.
9.2.1.2	The ETCS buttons accessing the sub-level windows shall be available with the labels as specified in 8.5 but with their size and location depending on the ergonomic arrangements of areas of the NTC default window of the corresponding National System.

1.7.2.3 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text

1.7.2.4 For STM from FFFIS STM specification [3]

Chapter	Text
13.5.1.1	The configuration of the customisable DMI shall define the following data for each STM using the customisable DMI service:
13.5.1.1.10	<p>Moved areas of the ETCS layout:</p> <p>a) If a STM needs partially or totally the cells used by an area defined in the ETCS layout and in which ETCS DMI objects are displayed in level NTC modes SN or NL, the ETCS objects displayed in it must be moved somewhere else on the national layout. Therefore it shall be possible to specify a changed location for moving the following ETCS areas and their related ETCS objects. For buttons also the new related soft key (F1-F5) must be defined:</p> <ul style="list-style-type: none"> • Areas F1-F5 for the buttons for selecting the main, override, data view, special or settings window; • Area A4 for the adhesion “slippery rail”; • Areas B7 and C8 for the ETCS mode and level display; • Area C1 for the mode/level acknowledgements; • Area C7 for the Override status indication; • Area C9 for the brake indication; • Area E1 for safe radio connection indication; • Area G13 for local time <p>b) The new location shall be specified by a new x:y position in cells.</p> <p>c) The moved areas shall have the same size as the original ETCS areas.</p>

1.8 DMI of non active STM

1.8.1 Diagram

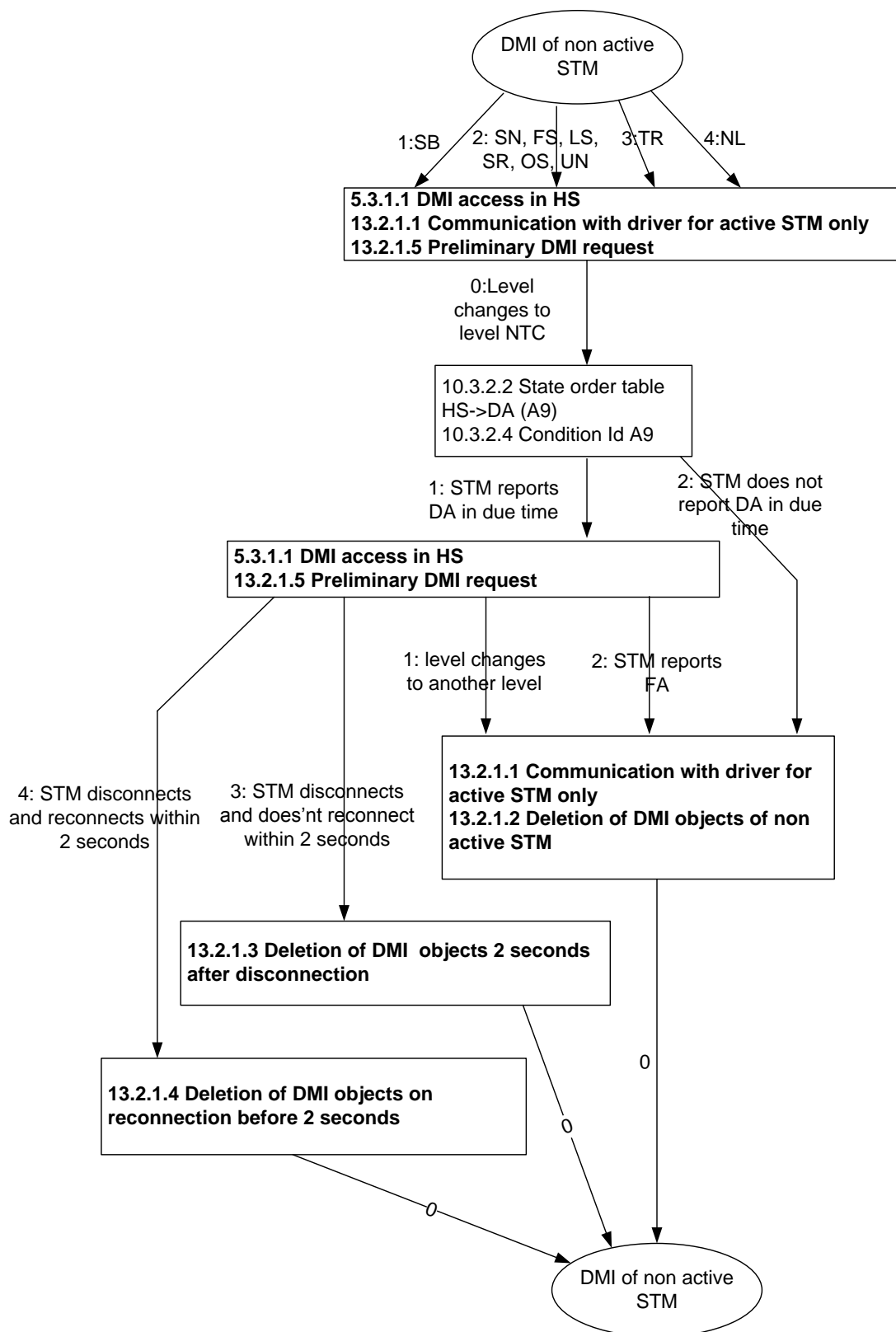


Diagram 37 – 7 h – DMI of non active STM

1.8.2 Relevant requirements

1.8.2.1 ETCS DMI Specification [12]

Chapter	Text

1.8.2.2 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text																																																						
5.3.1.1	<p>The ERTMS/ETCS on-board shall allow the STM to access its functions and resources according to the following table:</p> <p>a) x = access is allowed in all Levels</p> <p>b) (x) = access is allowed in all Levels if possible</p> <p>c) s = access is only allowed for an active STM (see chapter 4.1.1.3)</p> <p>d) h = access is allowed for an STM in HS for preliminary request for DMI objects (see 13.2.1.5)</p> <table><tr><th>ERTMS/ETCS ON-BOARD functions and resources available for STMs</th><th>N</th><th>S</th><th>P</th><th>S</th><th>F</th><th>L</th><th>S</th><th>OS</th><th>S</th><th>N</th><th>U</th><th>T</th><th>P</th><th>S</th><th>I</th><th>S</th><th>R</th></tr><tr><td></td><td>P</td><td>B</td><td>S</td><td>H</td><td>S</td><td>S</td><td>R</td><td></td><td>L</td><td>L</td><td>N</td><td>R</td><td>T</td><td>F</td><td>S</td><td>N</td><td>V</td></tr><tr><td>DMI Function</td><td></td><td>h</td><td></td><td></td><td>h</td><td>h</td><td>h</td><td>h</td><td></td><td>s, h</td><td>h</td><td>h</td><td>h</td><td></td><td></td><td>s, h</td><td></td></tr></table>	ERTMS/ETCS ON-BOARD functions and resources available for STMs	N	S	P	S	F	L	S	OS	S	N	U	T	P	S	I	S	R		P	B	S	H	S	S	R		L	L	N	R	T	F	S	N	V	DMI Function		h			h	h	h	h		s, h	h	h	h			s, h	
ERTMS/ETCS ON-BOARD functions and resources available for STMs	N	S	P	S	F	L	S	OS	S	N	U	T	P	S	I	S	R																																						
	P	B	S	H	S	S	R		L	L	N	R	T	F	S	N	V																																						
DMI Function		h			h	h	h	h		s, h	h	h	h			s, h																																							
13.2.1.1	The ERTMS/ETCS on-board shall only allow the active STM to communicate with the driver.																																																						
13.2.1.2	When the STM is no more active (see 4.1.1.3), the ERTMS/ETCS on-board shall delete all DMI objects controlled by this STM.																																																						
13.2.1.3	When the connection between an STM and the DMI Function is disconnected, the ERTMS/ETCS on-board shall delete all the DMI objects controlled by this STM (including preliminary requests) after a timeout of 2 seconds.																																																						
13.2.1.4	When the connection between the active STM and the DMI Function is lost and reestablished within the timeout of 2 seconds, the ERTMS/ETCS on-board shall delete all the DMI objects controlled by the STM when the DMI connection to the STM is established.																																																						
13.2.1.5	The ERTMS/ETCS on-board shall be able to receive and store preliminary request for DMI objects from an STM being in HS state and display them immediately after having received the DA state report.																																																						
13.2.1.6	When an STM reports PO, CS or FA, or is considered as failed, the ERTMS/ETCS onboard shall delete all preliminary requests for DMI objects from this STM.																																																						

1.8.2.3 For STM from FFFIS STM specification [3]

Chapter	Text

1.9 Display of ETCS train speed

1.9.1 Diagram

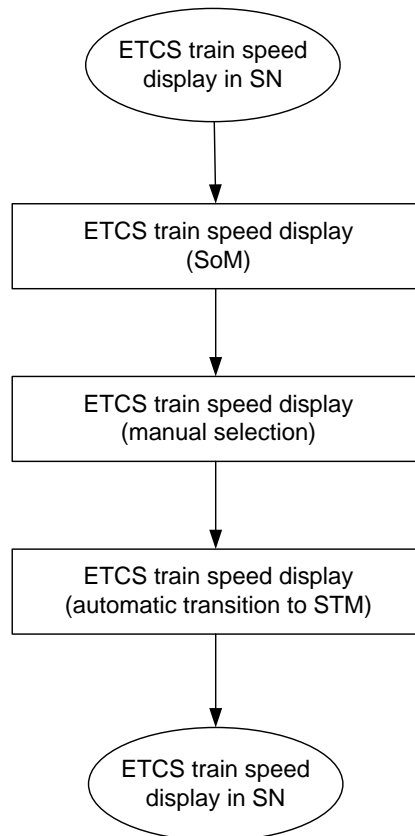


Diagram 38 - 7 i1 - Display of ETCS train speed main

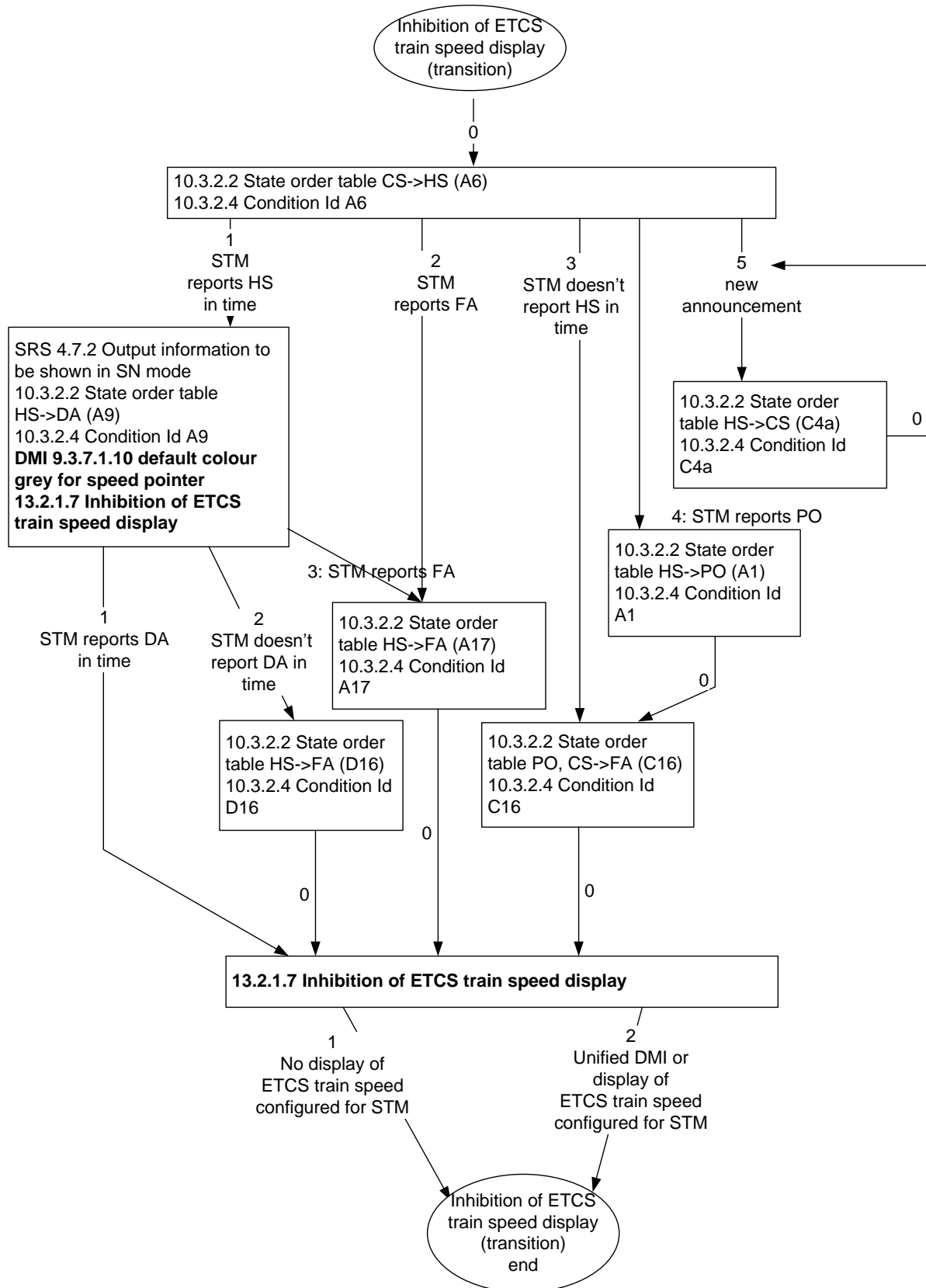


Diagram 39 - 7 i2 - Display of ETCS train speed at automatic transition

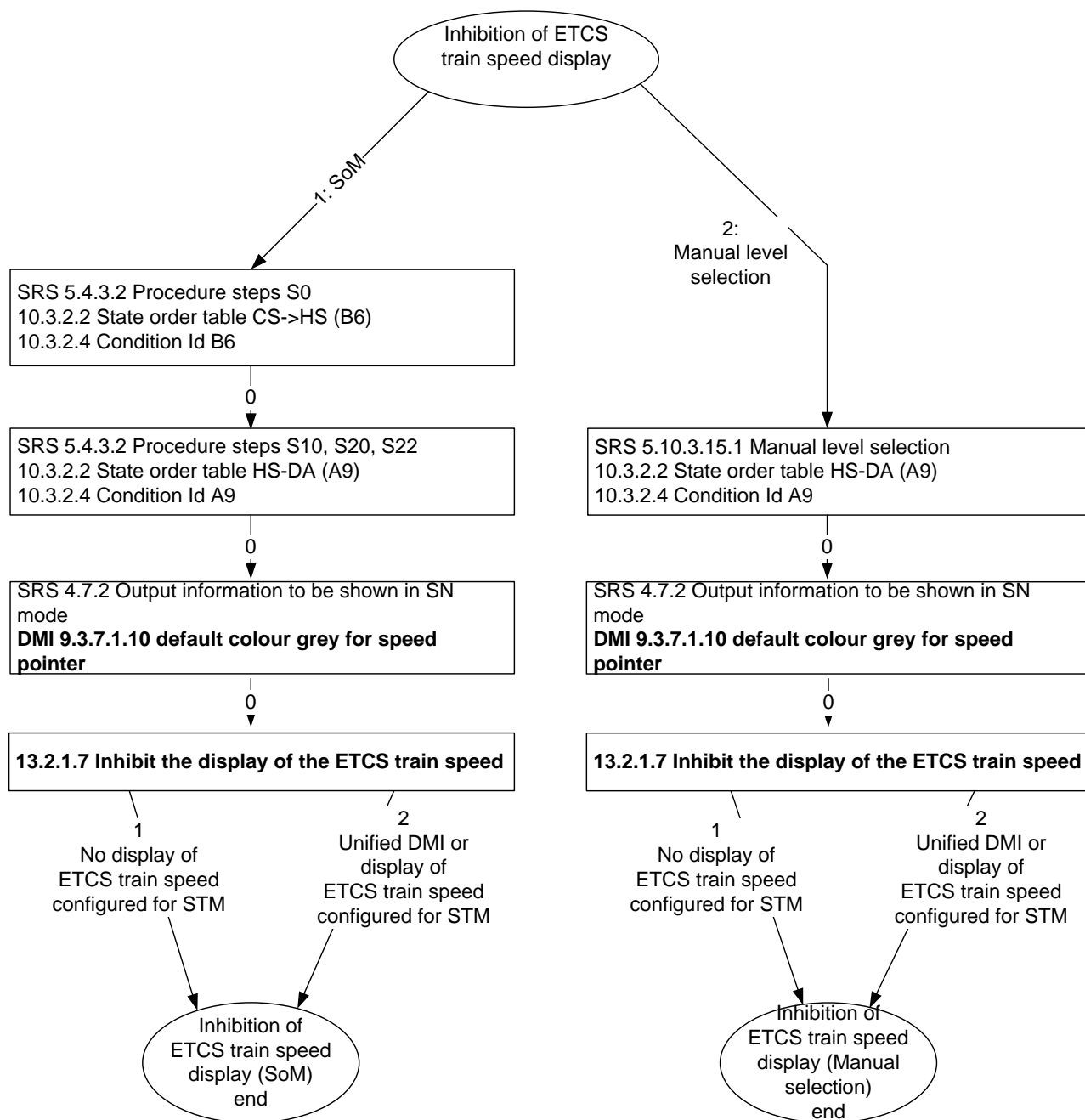


Diagram 40 - 7 i3 - Display of ETCS train speed at SoM and manual level selection

1.9.2 Relevant requirements

1.9.2.1 SRS [2]

Chapter	Text
4.7.2	DMI versus mode table: Output information to be shown in SN mode

	Always shown (X): mode, level Shown under additional conditions (A): train speed, ...
5.4.3.2	Start of Mission Procedure, step S0: The Start of Mission procedure shall be engaged when the ERTMS/ETCS on-board equipment is in Stand-By mode with a desk open and no communication session is established or is being established.
5.4.3.2	Start of Mission Procedure, step S10: The ERTMS/ETCS on-board equipment shall offer the possibility to the driver to select SH, NL, or to select Train Data Entry. <ul style="list-style-type: none"> • ... • ... • If the driver selects Train Data Entry (E11), the process shall go to S12 • ..
5.4.3.2	Start of Mission Procedure, step S20: The ERTMS/ETCS on-board equipment shall offer the possibility to the driver to select "Start" <p>a) When the validated level is NTC and the driver selects "start" (E20), the process shall go to S22 ...</p>
5.4.3.2	Start of Mission Procedure, step S22: The ERTMS/ETCS on-board equipment shall request an acknowledgement from the driver for running under supervision of the selected National System. When the driver acknowledges (E30), the mission starts in SN mode (refer to SRS chapter 4, transitions between modes). Following E30, if the position is still invalid, the ERTMS/ETCS on-board shall delete the train position data (new status: "unknown").
5.10.3.15.1	In addition to the level transitions ordered by trackside, it is also possible, at standstill, for the driver to change the ERTMS/ETCS level (refer to section 3.18.4.2).

1.9.2.2 ETCS DMI Specification [12]

Chapter	Text
9.3.7.1.10	As long as no information has been sent by the STM, the train speed pointer shall be displayed in grey and no other supervision information shall be displayed.

1.9.2.3 For ERTMS/ETCS on-board from FFFIS STM specification [3]

Chapter	Text
10.3.2.2	STM state order table (ERTMS/ETCS on-board STM Control Function) (A1, A6, A9, A17, B6, C4a, C16, D16)
10.3.2.4	STM state order conditions table applicable to STM X, associated to Level NTC X (ERTMS/ETCS on-board STM Control Function)
10.3.2.4	A1: (STM X connects to the STM Control Function) AND (STM X reports PO state)
10.3.2.4	A6: (A transition to Level NTC X for a further location is stored on-board) AND (STM X reports CS state) AND (no other STM reports HS state)
10.3.2.4	A9: (level of the ERTMS/ETCS on-board is Level NTC X) AND (STM X reports

	CS or HS state) AND (no other STM reports DA state) AND (ETCS mode is SN, SL or NL)
10.3.2.4	A17: (STM X reports FA state)
10.3.2.4	B6 : (ETCS mode is SB) AND (Cab is active) AND (valid level of the ERTMS/ETCS on-board is Level NTC X) AND (STM X reports CS state) AND (no other STM reports HS state)
10.3.2.4	C4a: (announcement for a transition to Level NTC X is stored) AND (STM X reports HS state) AND (a level transition order to Level NTC Y is received before the transition to Level NTC X) AND (STM X is different from the STM Y associated to Level NTC Y)
10.3.2.4	C16: (the STM Control Function has sent a state transition order except “DA state transition order” and except “conditional CS state transition order”) AND (STM X does not report the required state within a maximum delay time of 10 seconds)
10.3.2.4	D16: (the STM Control Function has sent a “DA state transition order”) AND (STM X does not report the required state within a maximum delay time of 5 seconds)
13.2.1.7	If the ETCS train speed is configured not to be displayed for an STM while the ERTMS/ETCS on-board is in SN mode (see chapter 13.5.1.1.7), the ERTMS/ETCS on-board shall inhibit the display of the ETCS train speed only once the DA state report is received from this STM by the STM Control Function

1.9.2.4 For STM from FFFIS STM specification [3]

Chapter	Text

1.10 Table of Diagrams

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2. TEST CASES

2.1 Configuration

The configuration test cases are contained in document SUBSET-074-2-7-a.

2.2 Indicators

The test cases for indicators are contained in document SUBSET-074-2-7-b.

2.3 Buttons

The test cases for buttons are contained in document SUBSET-074-2-7-c.

2.4 Text messages

The test cases for text messages are contained in document SUBSET-074-2-7-d.

2.5 Sounds

The test cases for sounds are contained in document SUBSET-074-2-7-e.

2.6 Supervision information

The test cases for supervision information are contained in document SUBSET-074-2-7-f.

2.7 Moved ETCS areas

The test cases for moved ETCS areas are contained in document SUBSET-074-2-7-g.

2.8 DMI of non active STM

The test cases for DMI of non active STM are contained in document SUBSET-074-2-7-h.

2.9 Display of ETCS train speed

The test cases for display of ETCS train speed are contained in document SUBSET-074-2-7-i.

2.10 General remarks for Test Cases of FID 7

The time between test steps in the following test specifications is generally chosen thus that the expected output reactions are performed by the DUT before the next test step is triggered. If the check of DMI outputs is performed manually it may however be necessary to increase the time between the steps, in order to give the tester time to verify the expected test results.

In this FID there are no STM test cases, because it is optional for the STMs to use the DMI function of the ERTMS/ETCS on-board.

For the following test case specifications also a short message format is used besides the full message format as specified in chapter 1 of SUBSET-074. The full message format has one line for each message variable, specifying the variable name, length in bits, value and description. The short message format has one line for simple packets and one line per 1-3 iterated sub structures for packets with iterations. The short message format specifies a packet by its packet number and the sequence of variables. A variable is specified by its shortened variable name and value plus an optional description. The short message format is only used, if a similar packet with the same identifier has been presented for the same test case before.



2 samples are presented below.



2.10.1 Message format sample 1

Full message format

Message-S1: STM requests display of buttons 1-2 at positions 1-2			
VARIABLE	Length	VALUE	COMMENT
NID_STM	8	FINITE_VALUE	NID_STM of the active STM
L_MESSAGE	8	26	Message Length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	25	Packet Length
NID_STMSTATE	4	7	State DA
NID_PACKET	8	32	Button request from STM (STM-32)
L_PACKET	13	162	Packet Length
N_ITER	5	2	Request for 2 buttons
NID_BUTTON(1)	8	1	Button 1
NID_BUTPOS(1)	5	1	
NID_ICON(1)	8	0	
M_BUT_ATTRIB(1)	10	1000010000B	
L_CAPTION(1)	6	4	Caption="BUT1"
X_CAPTION(1,1)	8	'B'	
X_CAPTION(1,2)	8	'U'	
X_CAPTION(1,3)	8	'T'	
X_CAPTION(1,4)	8	'1'	



NID_BUTTON(2)	8	2	Button 2
NID_BUTPOS(2)	5	2	
NID_ICON(2)	8	0	
M_BUT_ATTRIB(2)	10	1000010000B	
L_CAPTION(2)	6	4	Caption="BUT2"
X_CAPTION(2,1)	8	'B'	
X_CAPTION(2,2)	8	'U'	
X_CAPTION(2,3)	8	'T'	
X_CAPTION(2,4)	8	'2'	
Padding bits	5	00000B	

Shortened message format

Message-S1: STM requests display of buttons 1-2 at positions 1-2			
VARIABLE	Length	VALUE	COMMENT
NID_STM	8	FINITE_VALUE	NID_STM of the active STM
L_MESSAGE	8	26	Message Length
STM-15: PL=25, ST=7, (State DA)			
STM-32: PL=164, N=2, ID=1, P=1, IC=0, MI=1000010000B, L=4, T="BUT1"			
(2): ID=2, P=2, IC=0, MI=1000010000B, L=4, T="BUT2"			



2.10.2 Message format sample 2

Full message format

Message-S1: STM removes indicators 1 - 18			
VARIABLE	Length	VALUE	COMMENT
NID_STM	8	FINITE_VALUE	NID_STM of the active STM
L_MESSAGE	8	92	Message Length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	25	Packet Length
NID_STMSTATE	4	7	State DA
NID_PACKET	8	35	Indicator request from STM (STM-35)
L_PACKET	13	692	Packet Length
N_ITER	5	18	Request for 18 indicators
NID_INDICATOR(1)	8	1	Indicator 1
NID_INDPOS(1)	5	1	
NID_ICON(1)	8	0	
M_IND_ATTRIB(1)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(2)	8	2	Indicator 2
NID_INDPOS(2)	5	2	
NID_ICON(2)	8	0	

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M_IND_ATTRIB(2)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(3)	8	3	Indicator 3
NID_INDPOS(3)	5	3	
NID_ICON(3)	8	0	
M_IND_ATTRIB(3)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(4)	8	4	Indicator 4
NID_INDPOS(4)	5	5	
NID_ICON(4)	8	0	
M_IND_ATTRIB(4)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(5)	8	5	Indicator 5
NID_INDPOS(5)	5	6	
NID_ICON(5)	8	0	
M_IND_ATTRIB(5)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(6)	8	6	Indicator 6
NID_INDPOS(6)	5	7	
NID_ICON(6)	8	0	
M_IND_ATTRIB(6)	10	0000000000b	



L_CAPTION(1)	6	0	
NID_INDICATOR(7)	8	7	Indicator 7
NID_INDPOS(7)	5	8	
NID_ICON(7)	8	0	
M_IND_ATTRIB(7)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(8)	8	8	Indicator 8
NID_INDPOS(8)	5	9	
NID_ICON(8)	8	0	
M_IND_ATTRIB(8)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(9)	8	9	Indicator 9
NID_INDPOS(9)	5	10	
NID_ICON(9)	8	0	
M_IND_ATTRIB(9)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(10)	8	10	Indicator 10
NID_INDPOS(10)	5	11	
NID_ICON(10)	8	0	
M_IND_ATTRIB(10)	10	0000000000b	
L_CAPTION(1)	6	0	



NID_INDICATOR(11)	8	11	Indicator 11
NID_INDPOS(11)	5	12	
NID_ICON(11)	8	0	
M_IND_ATTRIB(11)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(12)	8	12	Indicator 12
NID_INDPOS(12)	5	13	
NID_ICON(12)	8	0	
M_IND_ATTRIB(12)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(13)	8	13	Indicator 13
NID_INDPOS(13)	5	14	
NID_ICON(13)	8	0	
M_IND_ATTRIB(13)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(14)	8	14	Indicator 14
NID_INDPOS(14)	5	15	
NID_ICON(14)	8	0	
M_IND_ATTRIB(14)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(15)	8	15	Indicator 15



NID_INDPOS(15)	5	16	
NID_ICON(15)	8	0	
M_IND_ATTRIB(15)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(16)	8	16	Indicator 16
NID_INDPOS(16)	5	17	
NID_ICON(16)	8	0	
M_IND_ATTRIB(16)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(17)	8	17	Indicator 17
NID_INDPOS(17)	5	18	
NID_ICON(17)	8	0	
M_IND_ATTRIB(17)	10	0000000000b	
L_CAPTION(1)	6	0	
NID_INDICATOR(18)	8	18	Indicator 18
NID_INDPOS(18)	5	19	
NID_ICON(18)	8	0	
M_IND_ATTRIB(18)	10	0000000000b	
L_CAPTION(1)	6	0	
Padding bits	3	000b	



Short message format

Message-S2: STM removes indicators 19 - 36			
VARIABLE	Length	VALUE	COMMENT
NID_STM	8	FINITE_VALUE	NID_STM of the active STM
L_MESSAGE	8	92	Message Length
STM-15: PL=25, ST=7, (State DA)			
STM-35: PL=692, N=18, ID=19, P=1, IC=0, MI=0000000000b, L=0			
(2): ID=20, P=2, IC=0, MI=0000000000b, L=0			
(3): ID=21, P=3, IC=0, MI=0000000000b, L=0			
(4): ID=22, P=5, IC=0, MI=0000000000b, L=0			
(5): ID=23, P=6, IC=0, MI=0000000000b, L=0			
(6): ID=24, P=7, IC=0, MI=0000000000b, L=0			
(7): ID=25, P=8, IC=0, MI=0000000000b, L=0			
(8): ID=26, P=9, IC=0, MI=0000000000b, L=0			
(9): ID=27, P=10, IC=0, MI=0000000000b, L=0			
(10): ID=28, P=11, IC=0, MI=0000000000b, L=0			
(11): ID=29, P=12, IC=0, MI=0000000000b, L=0			
(12): ID=30, P=13, IC=0, MI=0000000000b, L=0			
(13): ID=31, P=14, IC=0, MI=0000000000b, L=0			
(14): ID=32, P=15, IC=0, MI=0000000000b, L=0			
(15): ID=33, P=16, IC=0, MI=0000000000b, L=0			



(16): ID=34, P=17, IC=0, MI=00000000000b, L=0
(17): ID=35, P=18, IC=0, MI=00000000000b, L=0
(18): ID=36, P=19, IC=0, MI=00000000000b, L=0

Very short format

Message-S2: STM removes indicators 19 - 36			
VARIABLE	Length	VALUE	COMMENT
NID_STM	8	FINITE_VALUE	NID_STM of the active STM
L_MESSAGE	8	92	Message Length
STM-15: PL=25, ST=7, (State DA)			
STM-35: PL=692, N=18, ID=19, P=1, IC=0, MI=00000000000b, L=0			
(2): ID=20, P=2, IC=0, MI=00000000000b, L=0	(3): ID=21, P=3, IC=0, MI=00000000000b, L=0	(4): ID=22, P=5, IC=0, MI=00000000000b, L=0	
(5): ID=23, P=6, IC=0, MI=00000000000b, L=0	(6): ID=24, P=7, IC=0, MI=00000000000b, L=0	(7): ID=25, P=8, IC=0, MI=00000000000b, L=0	
(8): ID=26, P=9, IC=0, MI=00000000000b, L=0	(9): ID=27, P=10, IC=0, MI=00000000000b, L=0	(10): ID=28, P=11, IC=0, MI=00000000000b, L=0	
(11): ID=29, P=12, IC=0, MI=00000000000b, L=0	(12): ID=30, P=13, IC=0, MI=00000000000b, L=0	(13): ID=31, P=14, IC=0, MI=00000000000b, L=0	
(14): ID=32, P=15, IC=0, MI=00000000000b, L=0	(15): ID=33, P=16, IC=0, MI=00000000000b, L=0	(16): ID=34, P=17, IC=0, MI=00000000000b, L=0	
(17): ID=35, P=18, IC=0, MI=00000000000b, L=0	(18): ID=36, P=19, IC=0, MI=00000000000b, L=0		

2.10.3 Supplier-specific delays table

#	Supplier	Starttime	Endtime
Ts1a	ETCS	For STM not reporting in time: timestamp of message including stateorder to state \neq DA or CCS +10s	Reference time of display of message [name of NTC failed]
Ts1b	ETCS	For STM not reporting in time: timestamp of message including stateorder to state DA +5s	Reference time of display of message [name of NTC failed]
Ts1c	ETCS	Timestamp of message including STM report of FA	Reference time of display of message [name of NTC failed]
Ts2a	ETCS	For STM not reporting in time: timestamp of message including stateorder to state \neq DA or CCS +10s	timestamp of message including state order to FA
Ts2b	ETCS	For STM not reporting in time: timestamp of message including stateorder to state DA +5s	timestamp of message including state order to FA
Ts3a	ETCS	Reference time of border balise for Level NTC X or Reference time of border passed for level NTC X (border balise not passed) or Reference time of level NTC X acknowledged by driver at SoM or Reference time of level NTC X manually selected by driver	Reference time of default window display adaptation for STM X (speed dial range, moved areas)
Ts3b	ETCS	Reference time at which the driver acknowledged the trip after standstill after border to NTC X	Reference time of default window display adaptation for STM X (speed dial range, moved areas)
Ts3c	ETCS	Timestamp of message including STM report of FA (for active STM) or Reference time of border balise for Level 1	Reference time of default window display restauration for ETCS (speed dial range, moved areas)
Ts3d	ETCS	For STM not reporting in time: timestamp of message including stateorder to state DA +5s	Reference time of default window display restauration for ETCS (speed dial range, moved areas)
Ts4	ETCS	Timestamp of message including state request to state CS from STM in CO	Timestamp of message including stateorder to CS
Ts5	ETCS	Timestamp of message including state request to state CS from STM in DE	Timestamp of message including stateorder to CS
Ts6	ETCS	Timestamp of message including state report CS from STM	Timestamp of message including stateorder to HS according to transition B6
Ts7	ETCS	Reference time at which the ETCS train data have been validated in "Train data validation window"	Timestamp of message including start flag
Ts8	ETCS	Timestamp of message including start flag	Timestamp of message including message with train data packets STM- 175 and 176
Ts9	ETCS	Timestamp of message including End of Specific NTC Data Entry	Timestamp of message including stop flag

Ts10	ETCS	Reference time at which the mode acknowledgement button is activated in default window or Reference time at which the level NTC X is confirmed by the driver in the Level window	Timestamp of message including stateorder to DA according to transition A9
Ts11	ETCS	Timestamp of active DMI channel disconnect telegram by STM + 2s	Reference time at which the DMI objects of the STM are removed
Ts12	ETCS	Timestamp of message including STM-1 to re-establish the active DMI channel connection by the STM after a disconnection of less than 2s	Reference time at which the DMI objects of the STM are removed