Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Transport Protocol

APIM Phoenix Domain Controller Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.0

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Revision History

Date	Version	Notes	
October 4, 2021	1.0	Initial Release	

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1 General Requirements

1.1 Overview

A standard CAN message can only transport 8 bytes of information from transmitter to receiver. For an application that needs to transmit a packet of information which is greater then 8 bytes requires the use of a network level service. This service manages the segmentation of the information packet into separate CAN frames and transports each frame over the network in sequential order to the receiver. The service on the receiver will then reassemble the original information packet from the frames and provide it to the receiving application.

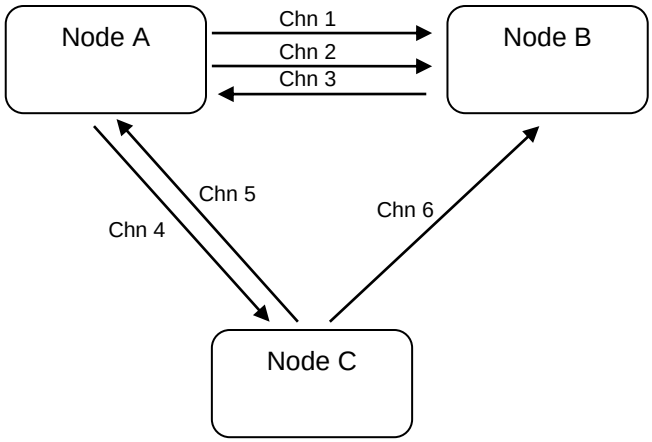
The network level service used by Ford Motor Company Infotainment Systems is based upon the ISO 15765-2 Network Layers Services specification. Specifically, Ford Motor Company has directed the use of Vector CANtech Multi-channel Transport Protocol. Therefore, through out this document, the term "transport layer/transport protocol" has been used synonymously with "network layer".

The responsibility of the following sections is to add a higher level protocol on top of this layer which will be responsible for managing physical & logical channels, channel utilization, channel status, fault handling, and data encapsulation.

1.2 Transport Channels

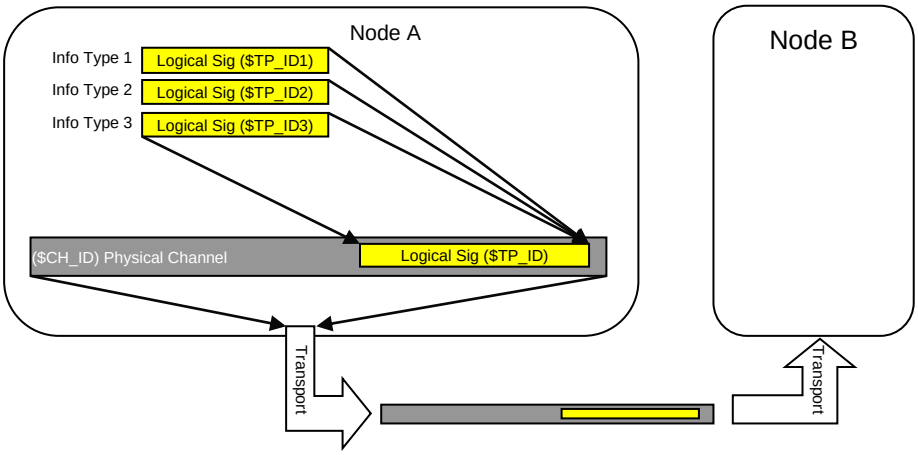
The network/transport layer services specified earlier establishes a communication link between two separate nodes. The link can be classified as a "physical channel" with a fixed assignment between two nodes to exchange data.

In other words, when two nodes wish to share data which requires the use of the "transport" protocol, the nodes must utilize the physical channels that have been assigned to them. The physical channel assignments are a requirement of the transport protocol and nodes can have multiple physical channels with other nodes.



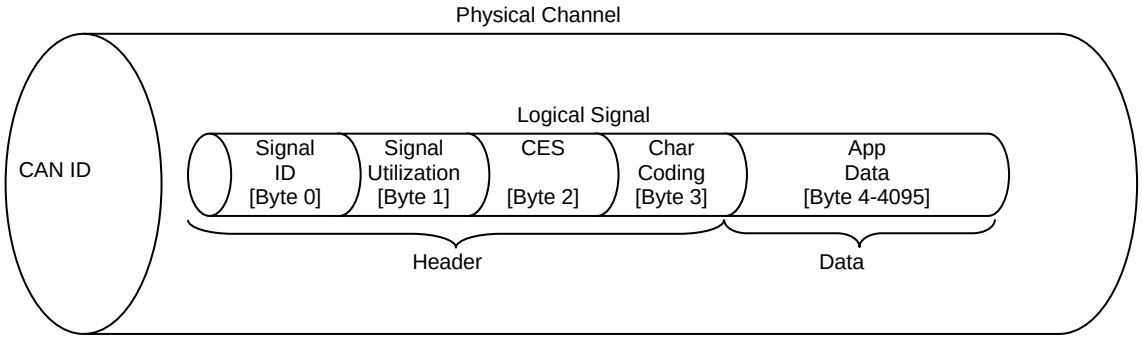
x

In an effort to maximize the use of the physical channels between two nodes, the concept of logical signals within a fixed physical channel is introduced. The use of logical signals aids in assigning different types of information to be transported between nodes over the same assigned physical channel. For example, Node A has one physical channel (ID=CH_ID) with Node B and can use the channel to send multiple types of information (Types 1, 2, 3). In the following example, each info type has been linked to a logical signal. The logical signals have then been linked to a physical channel.



1.2.1 Logical Channel Layout

As explained earlier, within a physical channel a logical signal is utilized to transport application level data from one node to another. The logical signal itself is represented as an information packet which has a header and associated data. The header contains information about the logical signal and the data in the logical signal. The App data portion of the packet is the logical signal specific data used by the application. A logical signal packet is structured with the following layout:



Field	Description
Signal ID	The Signal Identifier is used to determine between the different logical signals.
Signal Utilization	The Signal Utilization is used to link the information in the signal to the service.
CES	The CES is to use to reflect the status of a response to a request.
Char Coding	The Character coding flag indicates the selected coding table for the App data.
App Data	Application specific data

The logical signal header information is not listed explicitly in corresponding sequence diagrams and associated method tables of the SPSS.

Note: The logical signal packet structure defined above may not apply to all signals listed in the specification as some legacy signals may still be utilized. The legacy logical signals shall define their own signal packet structure within there respective sections.

1.2.1.1 TP-REQ-015124/A-Byte Definition (TcSE ROIN-138090-1)

All information within the channel is segmented in words, bytes and bits. The transmission shall begin with BYTE 0 and BYTE 0 shall always contain the Signal Identifier. The parsing of information shall begin at BYTE 0 and end with BYTE xyz.

1.2.1.2 TP-REQ-015125/A-Bit Definition (TcSE ROIN-138091-1)

Bit definition defines the bit position within the bytes.

1.2.1.3 TP-REQ-015126/A-Bit, Byte Ordering (TcSE ROIN-149367-3)

This section defines the order and significance of bits within bytes. Within a byte, the most significant bit, msb, is that which is transmitted first and the least significant bit, lsb, is that which is transmitted last, as illustrated below. The significance of the interior bits uniformly decreases in progression from msb to lsb. Therefore, Bit 0 is the msb and Bit 7 is the lsb. This representation follows "Motorola Sequential" format.

msb							lsb
Bit 0	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
Byte							

The format above shall be applied to ordering segmented bit-fields (each less than 8 bits) within a byte.

For example:

Byte 3: Character Coding

Bit 0-5: reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)

0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

If Coding Table II is selected, the byte/bit ordering would indicate : [00000001]

1.2.2 TP-REQ-015127/A-Signal Indentifier (TcSE ROIN-138089-1)

The Signal Identifier is used to determine between the different logical transport channels within a connection. Upon reception of a channel packet, the signal ID shall be inspected by the receiver to determine the type of information contained in the channel data portion of the packet.

1.2.3 TP-REQ-015128/I-Signal Utilization (TcSE ROIN-138092-7)

Since some logical signals can be reused for transporting similar type of information from different services (e.g. Folder_Name from CD, Folder_Name from USB), the Signal Utilization is used to link the information in the signal to the service.

Utilization assignments shall be done on an as needed basis.

UTILIZATION			
DEVICE GROUP	SERVICE NUMBER	PARAMETER NAME	PARAMETER DESCRIPTION
HIGH NIBBLE	LOW NIBBLE		
0	0	Service_Not_Present	No service of category "Radio" present
0	1	Radio_Service1	Radio General (AM, FM, AST,DAB,SDARS)
0	2	Radio_Service2	SDARS
0	3	Radio_Service3	DAB
0	4	Radio_Service4	Dynamic Station List
0	5	Radio_Service5	Radio Tagging
0	6	Radio_Sevice6	HD Radio
0	7-E	Radio_Service{Reserved}	Radio Service {Reserved}

0	F	Radio_ServiceInvalid	Service(s) invalid; inhibited
1	0	Service_Not_Present	No service of category "MediaPlayer" present
1	1	MP_Media1	CD
1	2	MP_Media2	BT Audio Streaming
1	3	MP_Media3	USB
1	4	MP_Media4	iPod
1	5	MP_Media5	SD
1	6	MP_Media6	DVD
1	7	MP_Media7	Generic Metadata
1	8-E	MP_Media{Reserved}	Media Player {Reserved}
1	F	MP_ServiceInvalid	Service(s) invalid; inhibited
2	0	Service_Not_Present	No service of category "Navigation" present
2	1	Nav_Service1	Mobile navigation
2	2	Nav_Service2	Navigation
2	3-E	Nav_Service{Reserved}	Navigation Service {Reserved}
2	F	Nav_ServiceInvalid	Service(s) invalid; inhibited
3	0	Service_Not_Present	No service of category "MobileCommunication" present
3	1	MobileCom_Service1	Mobile Phone
3	2	MobileCom_Service2	Embedded Modem; OnlineTraffic
3	3	MobileCom_Service3	Embedded Modem; Local Hazard Information
3	4	MobileCom_Service4	NFC
3	5-E	MobileCom_Service{Reserved}	Mobile communication Service {Reserved}
3	F	MobileCom_ServiceInvalid	Service(s) invalid; inhibited
4	0	Service_Not_Present	No service of category "Voice" present
4	1	Voice_Service1	Voice Recognition
4	2	Voice_Service2	VR with text capturing
4	3-E	Voice_Service{Reserved}	Voice Recognition Service {Reserved}
4	F	Voice_ServiceInvalid	Service(s) invalid; inhibited
5	0	Service_Not_Present	No service of category "Video" present
5	1-E	Video_Service{Reserved}	Video Service {Reserved}
5	F	Video_ServiceInvalid	Service(s) invalid; inhibited
6	0	Service_Not_Present	No service of category "Office" present
6	1-E	Office_Service{Reserved}	Office Service {Reserved}
6	F	Office_ServiceInvalid	Service(s) invalid; inhibited
7	0	Service_Not_Present	No service of category "Data" present
7	1	Data_Service1	SSP Data Services
7	2	Data_Service2	Component Diagnostic Data
7	3	Data_Service3	Traffic Data
7	4	Data_Service4	List Browser Data
7	5	Data_Service5	DataReport
7	6	Data_Service6	Trailer Settings
7	7	Data_Service7	Track App
7	8-E	Data_Service{Reserved}	Data Service {Reserved}
7	F	Data_ServiceInvalid	Service(s) invalid; inhibited

8	0	Service_Not_Present	No service of category "ChargeProgramming" present
8	1	Charge_Programming_Service1	Charge Programming
8	2-E	Charge_Programming_Service{Reserved}	Charge Programming {Reserved}
8	F	Charge_Programming_ServiceInvalid	Service(s) invalid; inhibited
9	0	Service_Not_Present	No service of category "ProjectionMode" present
9	1	Projection_Mode1	Projection Mode from external device
9	2-E	Projection_Mode{Reserved}	Projection Mode {Reserved}
9	F	Projection_ModeInvalid	Service(s) invalid; inhibited
F	F	Invalid	General invalid

1.2.4 TP-REQ-015129/B-Character Coding Flag (TcSE ROIN-138093-3)

The Character coding field is used to represent the selected coding table for the trained data stream (for text based information) in the TP message.

Byte 1: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)

0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

0x2: Coding Table III

0x00-0xFF RawData (Hexadecimal Notation)

If the character coding is set to "**Coding Table I**; *Unicode UTF-16*" than the 16-bit based ISO/IEC 10646 (Unicode); with the Unicode encoding form UTF-16BE (Big Endian) is to use.

If the character coding is set to "**Coding Table II**; *Latin-9*" then the single byte encoding form ISO-8859-15 (Latin-9) is to use.

If the character coding is set to state encoded values between 0x3 – 0x7 Reserved, than the 16-bit based ISO/IEC 10646 (Unicode); with the Unicode encoding form UTF-16BE (Big Endian) is to be used. See Coding Table I.

For all signals (e.g. GetPresetInfo2) with text content from RDS source (Radio Data System) the coding shall be fixed to RDS code-Table EBU Table1 specified within EN 50067. The Coding Table indicated in "Byte 1: Character Coding" shall be 0x1: Coding Table II.

For all signals with number content only (e.g. telephone numbers) the coding is fixed to Coding Table II if possible.

A coding table is not is applied to the embedded data in the TP signal if the character coding table is set to "**Coding Table III**; RawData".

If it is required to detail also the format of the data then additional information (byte / word / dword / … or / coding / compression / …) is added to this parameter or to a feature specific documentation external to this document.

Example: (Format: word)

0x2: Coding Table III
0x0000-0xFFFF Hexidecimal Notation

Or (format: byte)

0x2: Coding Table III
0x00-0xFF Hexidecimal Notation

To allow a “late binding” and ensure upgradability it is allowed to remove the format/attribute information from the character coding and define this in an external feature specific document.

Example: (“late binding”)

0x2: Coding Table III

This results in the fact that this information is external / not visible to the TP layer and this section. These information is detailed in the feature specific documentation. This concept allows a modification of the data content later on without impacting the TP layer and this specification.
This is required for e. g. TPEG traffic data raw data stream, “file transfer” or customer opt-in data.

Also BCD coded data will use this coding table flag.

Example: (BCD)

0x2: Coding Table III
0x0-0xF Hexidecimal Notation

1.2.5 TP-REQ-015130/A-RDS Latin Code Page (TcSE ROIN-169144-2)

Please refer to the RDS specification:

"IEC62106 Edition 2 see Annex E basic and extended RDS character sets"

1.2.6 TP-REQ-015131/A-Setting Character Coding Flag (TcSE ROIN-146167-1)

Since many media interfaces can provide textual information in many different formats, the transmitting node shall be responsible for determining which coding table shall be utilized for the most accurate representation of the text based information. The character coding evaluation must be done for each text based message transfer.

Character Code Determination for Coding Table I - Unicode Data
The transmitter node must evaluate if at least one character of the pending data transfer (for text based information) could not be represented with the Coding table II. If at least one character of the pending data transfer (for text based information) cannot be represented with Coding Table II, the Character Coding Flag shall be set to Coding Table I. All text based information for the pending data transfer shall be encoded according to Coding table I.

Character Code Determination for Coding Table II - Latin-9 Data
The transmitter node must evaluate if all characters of the pending data transfer (for text based information) can be represented with Coding table II. If all characters of the pending data transfer (for text based information) can be represented with Coding Table II, the Character Coding Flag shall be set to Coding Table II. All text based information for the pending data transfer shall be encoded according to Coding table II.

1.2.7 TP-REQ-015132/A-End of string definition (TcSE ROIN-146168-1)

For Coding Table I, the End Of String character (EOS), 0x0000 UTF-16BE, shall be used to terminate every string. If an empty string has to be transmitted, the End Of String character must be sent.

For Coding Table II, the End Of String character (EOS)is 0x00. If an empty string has to be transmitted, the End Of String character must be sent.

1.2.8 Dynamic Signal Length

1.2.8.1 TP-REQ-015133/A-Dynamic Signal Definition (TcSE ROIN-146172-1)

All logical signal shall be classified as dynamic signals with a variable physical length, but limited to a maximum value. Within each signal description the size of data in the signal will be specified but the physical signal length can vary. A dynamic signal must end with an EOS if it is requested in the signal description.

Dynamic signal indication

In this specification dynamic signals with a variable physical length are defined with the words "**Byte 1 up to xx**".

Example (Coding: Table I)
Specification entry:

Byte 1 up to 50: *DYNAMIC SIGNAL* name

Max. 25 characters. 24 letters plus 1 end of string character.

Physical signal layout of dynamic signal:

21 00 30 00 32 00 32 00
22 31 00 39 00 30 00 00 ← EOS

Example (Coding: Table II)
Specification entry:

Byte 1 up to 30: *DYNAMIC SIGNAL* name

Max. 30 characters. 29 letters plus 1 end of string character.

Physical signal layout of dynamic signal:

21 20 30 20 32 20 32 20
22 31 20 39 20 30 20 00 ← EOS

1.2.9 Command Execution Status

The Command Execution Status (CES) codes are used to indicate the status of a response to a request. Also, the CES codes are used in the status signals, either if triggered by a request signal or if internally triggered from the server application. The usage of each specific CES code shall be defined within each respective channel description. CES codes are separated into four main groups:

CES Range	CES Group
0x01 – 0x0F	Final Result – Success
0x10 – 0x1F	Final Result – Failure
0x20 – 0x2F	Final Result – Information
0x30 – 0x3F	Intermediate Result – Wait

1.2.9.1 TP-REQ-015134/B-CES Table (TcSE ROIN-138094-3)

The following table provides a listing of all available CES codes.

CES		PARAMETER NAME	PARAMETER DESCRIPTION
High nibble	Low nibble		
0	0	INVALID/INACTIVE	Used in request signals with CES field.
0	1	Final Result – Success / update available	General value for this group - Final result Success. Command processing completed. Final result available. General success for command execution without detailed information. No error occurred. Example 1: Requester is requesting list from source. List is present, full and accessible. The information is collected in the source, setup and transmitted within the defined time frame. Example 2: Server is transmitting new status information from source (e.g. LHN_EventInfo_St).

			The information is already collected in the source, setup and transmitted within the defined time frame.
0	2-F	Reserved	Reserved
1	0	Final Result – Failure	General value for this group - Final result Failure. Command processing completed. Final result available. General failure for command execution without detailed information. All other failures not specifically listed in this section (CES, High nibble: 1) shall be mapped to this value.
1	1	Final Result – Failure, item missing	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The requested item is not or no longer available. Example: The requester is requesting a list from the source. The source is responding with the requested, valid list. After the list is showing at the requester unit, the user deletes a list entry locally at the source. Than the user is requesting a list item that was deleted within the time, but was still visible in the requester list. In this cases the CES parameter: Failure, item missing is to set. Example: The track is changed and all track information need to be transmitted, but an ID3 tag (e.g. artist, genre) information is missing. The CES value of not available information is set to this value.
1	2	Final Result – Failure, request released	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The requested command is not or no longer stored in application. The request is released. The requester could re-init the command execution. Example: The command execution is stopped from the receiver unit. No result is presented from the receiver.
1	3	Final Result – Failure, request invalid	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The requested command (Signal ID) is known, but invalid for the receiver. Parameter combination not possible or unknown. Example: The requester is transmitting a request to the source. The defined maximum number of characters for a string variable number is 25 characters. The requester is requesting 35 characters from the source. This means the following

			parameter was not populated with the right values. This parameter combination is invalid.
1	4	Final Result – Failure, requested index out of range	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The requested index in the received command is out of range. Example: The protocol allows a maximum of 20 items (0-20). Five bits are reserved for this parameter in the data stream. A range from 0 to 31 is possible. The requester is asking for 22 items from a list, although 0-20 is only possible.
1	5	Final Result – Failure, connected environment (or device) not reacting	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The connected environment is not or no longer responding. The command could not be executed. Example: The requester is asking for a telephone service, but the telephone network from the chosen provider is not available. Example: The BT connection to the mobile is lost.
1	6	Final Result – Failure, device busy, request released	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The device or connected device is still busy. Requested application will not attempt to gather the information. The request is released from the application. Example: The connected device is busy or crashed. Media could not be accessed.
1	7	Reserved	Reserved
1	8	Final Result – Failure, connected device not or no longer readable	Command processing completed. Final result available. Failure for command execution with detailed information. Fault Information: The connected device is not or no longer readable. The command could not be executed. Example: The request is transmitted and received. The device reaches a point on the media where it is not readable. A meaningful response could not be given.
1	9-F	Reserved	Reserved
2	0	Final Result – Boarder of list reached	Command processing completed. Final result and information related to the command execution is available. Information: The end or the beginning of the available list is reached.

			Example: A list with no wrap around is delivered. If the user tries to brows up although the upper boarder is already reached, the source is responding with this parameter.
2	1	Final Result – List / Folder / Playlist / Selection empty	Command processing completed. Final result and information related to the command execution is available. Information: The requested list is empty. Example: The call stack feature is available and supported from the mobile phone. The call stacks from the telephone are requested. The call stacks are empty and have to be reported as empty.
2	2	Final Result – Device empty	Command processing completed. Final result and information related to the command execution is available. Information: The connected device is empty. Example: A blank media (USB-MSD, BT-MP, …) is connected. If access and browsing are possible, this response is given.
2	3	Final Result – Feature not supported from node	Command processing completed. Final result and information related to the command execution is available. Information: The feature connected to the request is not supported by this node or this version of the node. Example: The BVC is connected to the system. The current software flashed onto the BVC does not support the browsing feature for connected BT media players. If a request arrives to get the BT media player list, this response is given.
2	4	Final Result – Requested command not supported	Command processing completed. Final result and information related to the command execution is available. Information: The command signal ID is unknown to the receiver. Example: A request command is received. The TP signal ID is unknown to the receiver.
2	5	Final Result – Status changing	Command processing or status signal update completed. Final result and information related to the command execution is available. Information: The previous transferred information with this signal ID is invalidated. New information is not yet available. If the new information becomes available, a new signal is transmitted. Within the new signal the CES parameter is set to “Final Result – Success/ Update Available”

			Example: The status signal for ActiveFolderName related to the currently played track on the active CD is transmitted. The user request afterwards to change to another CD than the active one. The CD mechanism starts to move. Before the chosen track onto this CD is reached, the ActiveFolderName needs to be invalidated for the system, because during the described changing process, no folder path is available.
2	6	Final Result – Connected environment (or device) not or no longer present	Command processing or status signal update completed. Final result and information related to the command execution is available. Information: The connected environment is not or no longer present. The command could not be executed. Example: The request is transmitted and received. The device is un-plugged during command execution. Example: The requester tries to get information from the phone book what is delivered on the fly from the device. The request is received. Intermediate result is given. Before the final result is reached and all information is collected and transferred, the BT connection is lost or the BT link is switched off. This final result is to transfer.
2	7	Final Result – Feature not supported by connected environment (or device)	Command processing completed. Final result and information related to the command execution is available. Information: The feature connected to the request is not supported by this device or by this version of the device. Example: The connected BT phone only supports a blind redial of the last outgoing number without transferring the phone number to the BVC. In this case, if the last outgoing number is requested, this final result is to transfer.
2	8	Final Result – List full; not empty place left in list	Command processing completed. Final result and information related to the command execution is available. Information: List is full. Example: User tries to connect a BT device to the system. No empty slot for a BT device is free. This response / status information is given.
2	9	Final Result – No valid Data to proceed	Command processing completed. Final result and information related to the command execution is available. Information: No valid Data to proceed Example: The TMC Tuner has lost the TMC Station tuning information. The TMC server shall provide the

			needed information again. This response / status information is given.
2	A-F	Reserved	Reserved
3	0	Intermediate Result – Wait	General value for this section - Intermediate result. Command execution in progress. Final result not yet available. Intermediate result and information related to the command execution is available. Information: Wait, previous request is executing. The command is known and could be executed. The unit is processing, which means that the application is waiting for unit internal results or is waiting for the connected environment. Intermediate result transferred according to heartbeat strategy. Example: When scrolling through the Phonebook items, the user may push the Scroll-button faster than the items can be received and displayed. The next Phonebook item is requested not before the previous item is received. This way every single item is displayed to the user. When the user stops pushing the Scroll-button, scrolling stops immediately and no more Phonebook items are displayed.
3	1	Intermediate Result – Wait; device busy, previous received request released; new received request executed.	Command execution in progress. Final result not yet available. Intermediate result and information related to the command execution is available. Information: Wait, new request is executing. The command is known and could be executed. The unit is processing, which means that the application is waiting for unit internal results or is waiting for the connected environment. This response code indicates that the last received command is executed. All previous commands (with this signal ID) will not be executed. Intermediate result transferred according to heartbeat strategy. Example: First the user requests to list Phonebook items starting with character 'a', but changes the requested character to 's' before the items are received. Then the request for character 'a' is released and a new request for character 's' is sent.
3	2-F	Reserved	Reserved
4-F	0-F	Reserved	Reserved

1.2.9.2 TP-REQ-015135/A-CES Reserved Values (TcSE ROIN-138095-1)

If a "Reserved" CES value is received, this value shall be mapped to the "general" value of the related group as defined below:

"Reserved" CES values with a zero in the high nibble are mapped to "Final Result – Success / update available" (CES = 0x01).

"Reserved" CES values with a one in the high nibble are mapped to "Final Result – Failure" (CES = 0x10).

"Reserved" CES values with a two in the high nibble are mapped to "Final Result – Requested Command Not Supported" (CES = 0x24).

"Reserved" CES values with a three in the high nibble are mapped to "Intermediate Result – Wait" (CES = 0x30).

"Reserved" CES values in the 0x40 – 0xFF are mapped to "Invalid" (CES = 0x00).

1.2.9.3 TP-REQ-015136/A-CES Support (TcSE ROIN-138096-1)

All nodes assigned to receiving logical channels containing CES shall implement all values assigned to each channel. An appropriate reaction like re-transmission, show failure, show wait screen or show additional information shall be carried out as defined by CES description and HMI specification.

1.2.9.4 TP-REQ-015137/A-CES Reporting - Final Result – (CES = 0x01-0x2F) (TcSE ROIN-146451-2)

Responder

Success
If a request can be answered successfully, the high nibble of the parameter "Command execution status" is equal to '0'.

Failure
If a request has to be answered as failure, the high nibble of parameter "Command execution status" is equal to '1'.

Information
If a request cannot be answered, but additional information to this request is available, the high nibble of parameter "Command execution status" is equal to '2'.

No Previous Intermediate Response
When a request is received, and the responder can provide a final result within T_isoTPrsp, no intermediate result shall be given. No heartbeat function of this signal shall be activated.

Intermediate Response Finished
When the final result for a previous sequence of intermediate result ends the heartbeat shall be stopped.

Signal information
When the CES parameter is equal to Final Result – Failure (0x10-0x1F) or Final Result - Information (0x20-0x2F) all fields after the CES field will not be transmitted in the response signal. Attached arrays are not filled with information, the array and all attached records are not present, no EOS characters are filled in. Only if the CES parameter is equal to Final Result – Success (0x01), requested data is transmitted.

1.2.9.5 TP-REQ-015138/A-CES Reporting - Intermediate Result (CES = 0x30 – 0x3F) (TcSE ROIN-145779-1)

Responder
When a request is received, the responder shall determine if a final result can be provided within T_isoTPrsp. If a final result can not be provided within this time period then an "Intermediate Result" shall be provided. Once the "Intermediate Result" response sequence is started, the heartbeat function of this signal shall be activated. The heartbeat function is described in the section "Heartbeat".

Signal Information
When the CES parameter is equal to Intermediate Result all fields after the CES field shall not be transmitted in the response signal. Attached arrays are not filled with information, the array and all attached records are not present, no EOS characters are filled in, etc.

Requester
The requester unit is transmitting a request to the source. The source is answering with an intermediate result. There are two intermediate result responses available and each may have an impact on functions and HMI. Therefore, the following scenarios for the HMI have been defined and the implementation of these scenarios will be addressed at the HMI level. Responses will not swap during runtime, but are fixed to the scenario.

Response "Intermediate Result – Wait"

Scenario 1: The requester unit buffers the user input locally and waits for the Response "Final Result" before it sends a new request.

Implementation example: DTMF-Tones are entered in various order by the user, but processing speed is limited by the GSM-network. Then the DTMF-Tones need to be buffered and sent after the Response "Final Result".

Scenario 2: The requester unit increases or decreases the parameter internally until user input for this action ends.

Implementation example: To skip several Tracks, the user rapidly pushes the Skip-button. The number of Tracks to skip is increased in the requester unit until user ends pushing the Skip-button. Then the request is sent out with the actual value of Tracks to skip in total.

Scenario 3: The requester unit does not buffer the user input and waits for the Response "Final Result" before it sends a new request.

Implementation example: When scrolling through the Phonebook items, the user may push the Scroll-button faster than the items can be received and displayed. The next Phonebook item is requested not before the previous item is received. This way every single item is displayed to the user. When the user stops pushing the Scroll-button, scrolling stops immediately and no more Phonebook items are displayed.

Response " Intermediate Result – Wait; device busy, previous received request released; new received request executed "

Scenario: The requester unit may send out user input directly with a new request. The requester does not wait for each response to a request. If during the heartbeat period a new request is received, parameters related to the new request shall be updated in the responder. The "Intermediate Result – Wait; device busy, previous received request released; new received request executed" shall be transmitted again to give the requester feedback. The requester shall delete currently received information related to a superseded request, as soon as a new request is placed.

Implementation example 1: The user requests to list Phonebook items starting with character 'a', but changes the requested character to 's' before the items are received. The request for character 'a' is released and a new request for character 's' is sent.

Implementation example 2: The user requests to list Phonebook items starting with character 'a', but changes the requested character to 's' just as the items for 'a' have been received. The request for character 'a' is released and the 'a' information is deleted as soon as the new request for 's' is placed.

End of Intermediate Result

The intermediate result sequence is ended if a final result is reached.

1.2.9.6 TP-TMR-REQ-015139/A-T_isoTPrsp (TcSE ROIN-146458-1)

Name	Description	Units	Range	Resolution	Default
T_isoTPrsp	Maximum time period allowed for responder to determine if a Final-Result can be provided one a request is received.	msec	0-100	5	20

1.3 Channel Management

1.3.1 TP-REQ-015140/A-Concurrent Data Transmission (TcSE ROIN-145774-1)

During an ongoing signal transmission the need for an concurrent data transmission within the same channel could occur. For example, if the user is browsing continuously in a device which is currently playing the channel will be busy transporting the browse data. If, during browsing, the active track is ended and the next track is activated all track information like genre, artist and track name need to be transferred, but the channel is still busy transporting the browse data. The responder shall

not interrupt the ongoing data transfer. The responder shall store the pending data until the channel is free. When the channel is free, the pending data shall be transferred in regards to priority and topicality. E.g. if several tracks have been played during browsing, only the track information of the currently active track shall be transferred.

1.3.2 TP-REQ-015141/A-Multi-Channel Management (TcSE ROIN-199074-1)

A transmitting node may be assigned several physical channels with each connected to different receiving nodes. Also, these physical channels may have the capability to transport the same Logical Signal information to different subscribing nodes (e.g. ArtistName_St, GetTUPresetInfo_Rsp). The Logical Signal information is supplied from a server either upon request from a client application (e.g. GetTUPresetInfo.Rq) or upon change of status (i.e. "Pushed") within a server application (CurrentStationName.St).

For information sent ("Pushed") upon status change, the server shall send the data to all subscribing clients. Subscribing clients can be identified through the Signal and Channel Catalog. Within the Catalog, logical signals are assigned to physical channels and physical channels are assigned to transmitting and receiving nodes. Where a logical signal is assigned to more then one physical ID indicates that there are multiple subscribers of this information.

For information sent upon request, the server shall only respond to the specific requesting client and not to all clients capable of issuing the same request.

1.3.3 Signal Heartbeat

Due to the possibility that it may take an unspecified amount of time for a responder to provide information back to the requester, the "Intermediate Result – Wait" CES code is provided in the response message. To ensure that a requester does not wait forever for a response, a "heartbeat" strategy is employed for all logical signals in the "Wait" state.

1.3.3.1 TP-REQ-015142/A-Signal Heartbeat - Responder (TcSE ROIN-145775-1)

Responder

The heartbeat signaling function shall be activated, within the responder, immediately after the first transmission of a signal with an "Intermediate Result" (i.e. CES = 0x30 or 0x31). Once activated, the responder shall, on a periodic basis, re-transmit the "Wait" state signal with an "Intermediate Result". The periodic transmission rate shall be equal to THB_IntermediateRsp.

If multiple signals are in a "Wait" state, then each signal shall require its own heartbeat signaling function.

When the CES parameter is changed the signal shall be updated and the signal transmitted immediately.

When the CES parameter is equal to "Final Result" either success or failure, the heartbeat signaling function shall be canceled.

1.3.3.2 TP-REQ-015143/A-Signal Heartbeat - Requester (TcSE ROIN-146620-1)

Requester

When a requester receives a response with an "Intermediate Result", the requester shall activate a signal heartbeat monitoring session in which the Requester starts a received signal timer. Subsequent receptions of the same Signal ID with an "Intermediate Result" shall reset the respective received signal timer.

If multiple signals are in a "Wait" state, then each signal shall require its own heartbeat monitoring session.

The heartbeat monitoring session shall be canceled when a "Final Result" is received regardless of success or failure.

A signal shall be classified as "missing" if a respective signal is not received after 3 x THB_INTERMEDIATERSP. Once a signal is determined to be "missing", the heartbeat monitoring session shall be canceled and the original information request released without any retry.

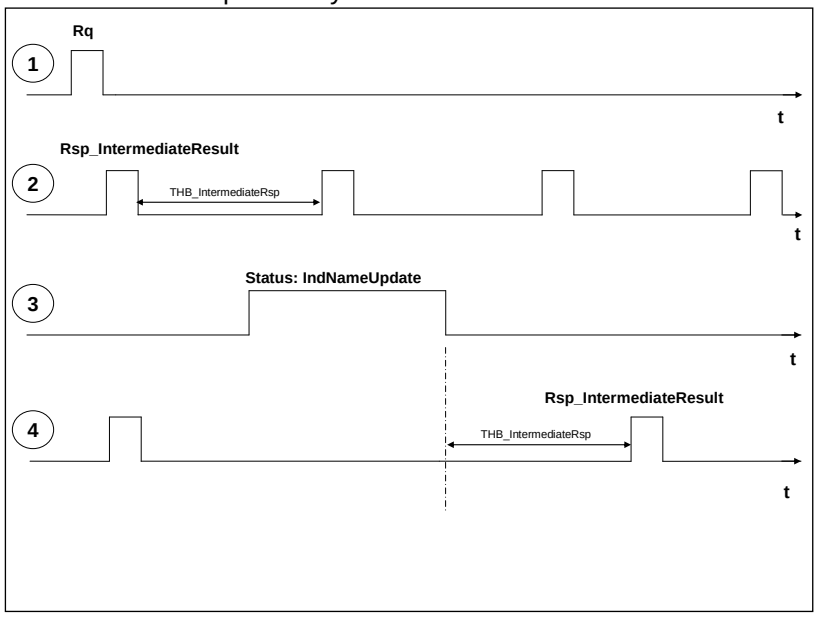
1.3.3.3 TP-REQ-015144/A-Concurrent Data Transmission During Heartbeat Session (TcSE ROIN-146621-1)

During an ongoing heartbeat session other logical signals on the same channel from the responder node to the requester node shall be allowed to occur. The periodic task for the heartbeat message transmission may occur while another signal is currently being transmitted. Since this other signal is originating from the same node, the node can be considered as "Node

Fully Operable". Therefore, the reception of another signal allocated to the same channel as the current "wait" state signal shall cause the received signal timer(s) for any signals on the same channel in a monitoring session to be reset.

After the transmission of the other signal, the heartbeat signaling function shall be restarted. If during the transmission of the other signal a final result is reached on the "wait" state signal, the final result shall be transmitted as soon as the bus is free.

The following figure will elaborate on the items previously mentioned.



(1) The request is placed from the requester node onto the bus system. This could be a CAN frame or a ISO-TP message

(2) The responder is answering with CES = Intermediate Result. After the first transmission the heartbeat function is activated. The timer is reloaded with THB_INTERMEDIATERSP. When the timer expires the next transmission with CES = Intermediate Result is performed. No other TP traffic occurs during the heartbeat transmission.

(3) & (4) After the responder is answering with CES = Intermediate Result other TP traffic occurs on the channel. Due to this other traffic, the heartbeat message transmission must be queued until the channel is free. After the completion of the other TP traffic, the heartbeat signaling function shall be restarted.

1.3.3.4 TP-TMR-REQ-015145/A-THB_IntermediateRsp (TcSE ROIN-146545-1)

Name	Description	Units	Range	Resolution	Default
THB_IntermediateRsp	Periodic transmit rate of the heartbeat message for signals in the "wait" state.	msec	0-1000	100	1000

1.4 Signal and Channel Catalog

1.4.1 Signal/Channel Mapping Tables

The following section shall provide the signal to channel mapping tables. The mapping tables provide a reference as to which logical signals will be contained in which physical channel. Please note that some logical signals can be contained in several physical channels. Consult the Signal Descriptions section for exact details of each signal.

1.4.1.1 TP-PHYv2-TPP-REQ-421600/A-RDISP - AUDIO

The RDISP – AUDIO channel is representing the channel connecting "RDISP" features and "AUDIO" features. The "RDISP" represents the multimedia display unit. The RDISP device could be a MFD or a headunit. "AUDIO" represents a Radio and / or CD unit. The "AUDIO" device could be a headunit like IAM/AHU/ACM/ACU.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: APIM_PDC Receiver: ACM_PAC		
0x2BC	AUDIO_RDISP_WORD_RX	15	Logical Signals		
			Signal ID	Signal Name	Utilization
			0xE3	BTConnection_Rq	MP_Media2

1.4.1.2 TP-PHYv2-TPP-REQ-421601/A-AUDIO - RDISP

The AUDIO – RDISP channel represent the signals connecting "AUDIO" features and "RDISP" display features. "AUDIO" represents a Radio and / or CD unit. The "AUDIO" device could be a headunit like IAM/AHU/ACM/ACU. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: ACM_PAC Receiver: APIM_PDC		
0x2B4	AUDIO_RDISP_WORD_Tx	15	Logical Signals		
			Signal ID	Signal Name	Utilization
			0x3B	RadioText_St	AMFM, DAB
			0x60	GetStationList_Rsp	Dynamic Station List
			0x63	GetTAGInfo_Rsp	AMFM
			0x52	GetFolderName_Rsp	CD
			0x3D	GetMPInfo_Rsp	CD
			0x3E	ActiveFolderInfo_St	CD
			0x3F	AlbumName_St	CD
			0x42	ArtistName_St	CD
			0x43	FileName_St	CD
			0x44	FolderName_St	CD
			0x45	GenreName_St	CD
			0x46	TrackName_St	CD
			0x64	GetCDTOCData_Rsp	CD
			0x6A	EnsembleName_St	AMFM, DAB
			0x6B	CurrentStationName_St	AMFM, DAB
			0x5F	GetTUPresetInfo_Rsp	AMFM, SDARS, DAB
			0x70	AHU_Bezel_Diag_Data	Data Service2
			0x3C	GetPresetInfo2_Rsp	AMFM, SDARS, DAB
			0x8D	RadioText2_St	DAB
			0x79	MediaInformation_St	AMFM, SDARS, DAB
			0x92	DynamicLabelPlus_St	DAB
			0x93	JournalineTxtMsg_St	DAB
			0xE4	BTConnection_Rsp	MP_Media2
			0xE2	UpdatedPresetInfo_St	AMFM, SDARS, DAB

1.4.1.3 TP-PHY-TPP-REQ-421602/A-RDISP - LBP_AUDIO

The RDISP - LBP_AUDIO channel is representing the channel connecting "RDISP" features and "LBP_AUDIO" features. The " RDISP " represents the multimedia display unit (e.g. Phoenix Domain Controller). "LBP_AUDIO" represents a Radio unit. The "LBP_AUDIO" device could be a headunit like Phoenix Audio Controller.

This channel is for Flow control only.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: APIM_PDC** **Receiver: ACM_PAC**
0xYYY	LBP_AUDIO_RDISP_WORD_RX		

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x76	LBP1_ItemInfo_Rsp	AMFM, SDARS, DAB

1.4.1.4 TP-PHY-TPP-REQ-421603/A-LBP_AUDIO - RDISP

The LPB_AUDIO – RDISP channel represent the signals connecting "LBP_AUDIO" features and "RDISP" display features. "LBP_AUDIO" represents a Radio and / or CD unit. The "LBP_AUDIO" device could be a headunit like Phoenix Audio Controler. RDISP represents the multimedia display unit. The RDISP device could be the Phoenix Domain Cotroler.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: ACM_PAC** **Receiver: APIM_PDC**
0xYYY	LBP_AUDIO_RDISP_WORD_Tx	15	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x76	LBP1_ItemInfo_Rsp	AMFM, SDARS, DAB

1.4.1.5 TP-PHY-TPP-REQ-023117/D-SDARS - RDISP (TcSE ROIN-147073-4)

The SDARS – RDISP channel represent the signals connecting "SDARS" features and "RDISP" display features. "SDARS" represents the satellite radio unit. The "SDARS" unit could be integrated into a headunit like IAM/AHU/ACM/ACU. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: SDARS** **Receiver: RDISP**
0x2C1	SDARS_RDISP_WORD_Tx	27	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x66	SDARS_Alert_St	SDARS
0x67	DispInfo_ArtistName_St	SDARS, HD Radio
0x68	SDARS_CatName_St	SDARS
0x69	SDARS_ChannelInfo_Rsp	SDARS
0x6C	SDARS_ChannelName_St	SDARS
0x6D	SDARS_CurrentCatList_Rsp	SDARS
0x6E	SDARS_SetAlert_Rsp	SDARS
0x6F	DispInfo_SongTitle_St	SDARS, HD Radio
0x73	SDARS_ESN_St	SDARS
0x7D	SDARS_PID_St	SDARS
0x76	LBP1_ItemInfo_Rsp	SDARS
0xA2	SDARS_ChannelList_Rq	SDARS

1.4.1.6 TP-PHY-TPP-REQ-023118/D-RDISP - SDARS (TcSE ROIN-147074-2)

The SDARS – RDISP channel represent the signals connecting "SDARS" features and "RDISP" display features. "SDARS" represents the satellite radio unit. The "SDARS" unit could be integrated into a headunit like IAM/AHU/ACM/ACU. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2C9	SDARS_RDISP_WORD_Rx	27

Transmitter: RDISP
Receiver: SDARS

Logical Signals

Signal ID	Signal Name	Utilization
0x65	SDARS_SetAlert_Rq	SDARS
0x80	ChannelInfo_Rq	SDARS
0x6C	SDARS_ChannelName_St	SDARS
0xA1	SDARS_ChannelList_Rsp	SDARS

1.4.1.7 TP-PHY-TPP-REQ-023119/A-SSPServer - SSPClient (TcSE ROIN-147240-1)

The SSPServer - SSPClient channel represent the signals connecting "Sirius Data Services" client and the server. This channel is used by the server to transport data to the client. The SSPClient may exist in a display module (e.g. MFD) and the SSPServer may exist in the AHU/ACM.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2C3	SSPClnt_SSPSrv_WORD_Tx	23

Transmitter: AHU
Receiver: APIM

Logical Signals

Signal ID	Signal Name	Utilization
0x62	SSP_Rsp	SDARS

1.4.1.8 TP-PHY-TPP-REQ-023120/A-SSPClient - SSPServer (TcSE ROIN-147262-1)

The SSPClient – SSPServer channel represent the signals connecting "Sirius Data Services" client and the server. This channel is used by the client to transport data to the server. The SSPClient may exist in a display module (e.g. MFD) and the SSPServer may exist in the AHU/ACM.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2CB	SSPClnt_SSPSrv_WORD_Rx	23

Transmitter: APIM
Receiver: AHU

Logical Signals

Signal ID	Signal Name	Utilization
0x61	SSP_Rq	SDARS

1.4.1.9 TP-PHY-TPP-REQ-013860/B-TMCServer - TMCClient (TcSE ROIN-159708-3)

The TMCServer – TMCClient channel is representing the channel connecting "TMCServer" features and "TMCClient" features. The "TMCClient" represents the multimedia display unit. The TMCClient device could be a MFD or a headunit. "TMCServer" represents a TMC Tuner unit. The "TMCServer" device could be a headunit like IAM/AHU/ACM/ACU.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: AHU Receiver: MFD		
0x2C4	TMCServer_TMCClient_WORD_Tx	33	Logical Signals		
			Signal ID	Signal Name	Utilization
			0x74	TMCData_St	TMC Data
			0x7A	TMCServiceProvider_St	TMC Data
			0x99	TrafficServicProvider_St	TMC Data

1.4.1.10 TP-PHY-TPP-REQ-023128/B-TMCClient - TMCServer (TcSE ROIN-178758-2)

The TMCClient – TMCServer channel is representing the channel connecting "TMCClient" features and "TMCServer" features. The "TMCClient" represents the multimedia display unit. The TMCClient device could be a MFD or a headunit. "TMCServer" represents a TMC Tuner unit. The "TMCServer" device could be a headunit like IAM/AHU/ACM/ACU.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: MFD Receiver: AHU		
0x2CC	TMCServer_TMCClient_WORD_Rx	33	Logical Signals		
			Signal ID	Signal Name	Utilization
			0x7B	TMCGetServiceProvider_Rq	TMC Data
			0x9A	TrafficeGetServiceProvider_Rq	TMC Data

1.4.1.11 TP-PHY-TPP-REQ-023121/A-Bezel - RDISP (TcSE ROIN-147429-1)

The Bezel – RDISP channel represent the signals connecting Bezel features and "RDISP" display features. Bezel represents a button input panel. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: FCIM Receiver: MFD		
0x2C6	Bezel_RDISP_WORD_TX	26	Logical Signals		
			Signal ID	Signal Name	Utilization
			0x71	EFP_Bezel_Diag_Data	Data_Services2

1.4.1.12 TP-PHY-TPP-REQ-015146/A-DSPAMP - RDISP (TcSE ROIN-147559-1)

The DSPAMP – RDISP channel represent the signals connecting DSPAMP features and "RDISP" display features. DSPAMP represents a remote audio amplifier. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel					
CAN ID	Msg Name	TP Index	Transmitter: DSP Receiver: MFD		
0x2C5	DSPAMP_RDISP_WORD_TX	25	Logical Signals		
			Signal ID	Signal Name	Utilization
			0x72	DSP_Bezel_Diag_Data	Data_Services2

1.4.1.13 TP-PHY-TPP-REQ-023123/A-LBP1Server - LBPClient (DELETED) (TcSE ROIN-159926-2)

1.4.1.14 TP-PHY-TPP-REQ-023124/F-NavRepServer - NavRepClient (TcSE ROIN-160780-1)

The NavRepServer – NavRepClient channel is representing the channel connecting "Navigation Repeater Server" features and "Navigation Repeater Client" features. The "Navigation Repeater Server" represents a navigation unit. "Navigation Repeater Client" represents a display module.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x2C0	NAV_MC_WORD_Tx	31	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x77	Destination_Info_St	Navigation
0x78	CurrentStreetName_St	Navigation
0x22	NavigationSymbolInfo_St	Navigation
0x20	StreetName_St	Navigation
0xA8	ProjMdeNavigationRepeater_St	Projection_Mode
0xAC	StreetName2_St	Navigation
0xAD	CurrentStreetName2_St	Navigation
0xE7	NavigationSymbolInfo2_St	Navigation
0xE8	DistanceToDestination2_St	Navigation

1.4.1.15 TP-PHY-TPP-REQ-023125/F-MediaPlayerServer - MediaPlayerClient (TcSE ROIN-160781-2)

The MediaPlayerServer – MediaPlayerClient channel is representing the channel connecting "Media Player Server" features and "Media Player Client" features. The "Media Player Server" represents a media playback unit. "Media Player Client" represents an instrument cluster.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x2B7	CONMP_MC_WORD_Tx	18	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x79	MediaInformation_St	Generic Metadata
0x76	LBP1_ItemInfo_Rsp	List Browser Data
0x5F	GetTUPresetInfo_Rsp	AMFM, SDARS, DAB
0x67	DispInfo_ArtistName_St	SDARS
0x68	SDARS_CatName_St	SDARS
0x6C	SDARS_ChannelName_St	SDARS
0x6F	DispInfo_SongTitle_St	SDARS
0xA9	ProjMdeMediaPlayerRepeater_St	Projection_Mode
0xB3	MediaInformation2_St	Generic Metadata
0xE5	SDARS_ChannelName2_St	SDARS
0xE6	SDARS_DynamicContentName_St	SDARS

1.4.1.16 TP-PHY-TPP-REQ-023126/F-PHONE - MC (TcSE ROIN-160782-3)

The PHONE – MC channel is representing the channel connecting "PHONE" features and "MC" features. The "MC" represents a multimedia display unit. "PHONE" represents a phone interface module.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2B6	PHONE_MC_WORD_Tx	17

Transmitter: See CAN database
Receiver: See CAN database

Logical Signals

Signal ID	Signal Name	Utilization
0x50	BTCallerIdentification_St	Phone
0x4F	InitiateBTCall_Rsp	Phone
0xA7	ActiveProjectionMode_St	Projection_Mode
0xAA	ProjMdePhoneRepeater_St	Projection_Mode
0xB2	BTCallerIdentification2_St	Phone
0xB5	BTPhoneName_Rsp	Phone

1.4.1.17 TP-PHY-TPP-REQ-023127/B-MC - PHONE (TcSE ROIN-160783-2)

The MC – PHONE channel is representing the channel connecting "MC" features and "PHONE" features. The "MC" represents a multimedia display unit. "PHONE" represents a phone interface module.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2BE	PHONE_MC_WORD_Rx	17

Transmitter: IPC
Receiver: MFD

Logical Signals

Signal ID	Signal Name	Utilization
0x0D	InitiateBTCall_Rq	Phone
0xBB	BTGetPhoneName_Rq	Phone

1.4.1.18 TP-PHY-TPP-REQ-023129/A-EnvStatReportServer - EnvStatReportClient (TcSE ROIN-201966-1)

The EnvStatReportServer – EnvStatReportClient channel represent the signals connecting "EnvStatReportServer " features and "EnvStatReportClient " features. "EnvStatReportServer " represents a Data Report unit. The "EnvStatReportServer " Could be a part of the IPC. "EnvStatReportClient" could be a display unit.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2C7	RepSrv_RepClient_WORD_Tx	24

Transmitter: see CAN database
Receiver: see CAN database

Logical Signals

Data Field ID	Signal Name	Utilization
0x7C	MyKeyReportCardOutput_Rsp	DataReport

1.4.1.19 TP-PHY-TPP-REQ-023130/A-EnvStatReportClient - EnvStatReportServer (TcSE ROIN-201967-1)

The EnvStatReportClient - EnvStatReportServer channel represent the signals connecting "EnvStatReportServer " features and "EnvStatReportClient " features. "EnvStatReportServer " represents a Data Report unit. The "EnvStatReportServer " Could be a part of the IPC. "EnvStatReportClient" could be a display unit.

This channel is for Flow Control only.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: see CAN database** **Receiver: see CAN database**
0x2CF	RepSrv_RepClient_WORD_Rx	24	

Logical Signals		
Data Field ID	**Signal Name**	**Utilization**
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1.4.1.20 TP-PHY-TPP-REQ-023131/L-APIM - TCU (TcSE ROIN-223472-2)

The APIM – TCU channel is representing the channel connecting "TCU" features and "APIM" features.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: APIM** **Receiver: TCU**
HS3 0x4A8 HS4 0x2BF	APIM_TCU_Word_Tx	20	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x82	ChargeProfileList_Rq	Charge Programming
0x84	ChargeSchedule_Rq	Charge Programming
0x86	SyncSoftwareVersion_Rsp	Charge Programming
0x94	WifiInfo_Rq	Embedded Modem
0xA3	MapVersionNumber_St	Nav_Service2 - Navigation
0XB8	ChargeProfileLocation_Rsp	ChargeProgramming
0xBD	LHI_SpeedProfileTableUpdate_Rq	MobileCom_Service3

1.4.1.21 TP-PHY-TPP-REQ-023132/K-TCU - APIM (TcSE ROIN-223473-3)

The TCU – APIM channel is representing the channel connecting "TCU" features and "APIM" features.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: TCU** **Receiver: APIM**
HS3 0x4A0 HS4 0x2B7	APIM_TCU_Word _Rx	20	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x81	CabinComfortPreferenceList_Rsp	Charge Programming
0x83	ChargeProfileList_Rsp	Charge Programming
0x85	ChargeSchedule_Rsp	Charge Programming
0x87	TelServESN_St	Charge Programming
0x88	TelServUserID_St	Charge Programming
0x90	EmergencyCallText_St	Embedded Modem

0x95	WifiInfo_Rsp	Embedded Modem
0x96	CarrierInfo_Rsp	Embedded Modem
0x97	DataUsage_Rsp	Embedded Modem
0x98	DeviceList_Rsp	Embedded Modem
0x9B	WifiHotspotMAC_Rsp	Embedded Modem
0xB6	ChargeProfileLocation_Rq	Charge Programming
0xBE	LHI_SpeedProfileTableUpdate_Rsp	MobileCom_Service3

1.4.1.22 TP-PHY-TPP-REQ-023133/C-MC - RDISP (TcSE ROIN-205503-2)

The MC – RDISP channel represent the signals connecting "RDISP" features and "MC" display features. "RDISP" represents a display unit. The "RDISP" device could be a MFD or a headunit. MC represents the Message Center unit. The MC device could be part of the instrument cluster.

Channel					
CAN ID	**Msg Name**	**TP Index**	**Transmitter: see CAN database** **Receiver: see CAN database**		
0x2A4	MC_RDISP_WORD_Tx	29	**Logical Signals**		
			Signal ID	**Signal Name**	**Utilization**
			0x7F	MCGetData_Rsp	--
			0x89	ConsHistGraph_St	Electrification Information
			0xF0	Track_Apps_St	Data_Service7

1.4.1.23 TP-PHY-TPP-REQ-023134/C-RDISP - MC (TcSE ROIN-205504-1)

The RDISP – MC channel is representing the channel connecting "RDISP" features and "MC" features. The "RDISP" represents the multimedia display unit. The RDISP device could be a MFD or a headunit. MC represents the Message Center unit. The MC device could be part of the instrument cluster.

This channel is used for Flow Control.

Channel					
CAN ID	**Msg Name**	**TP Index**	**Transmitter: see CAN database** **Receiver: see CAN database**		
0x2AC	MC_RDISP_WORD_Rx	29	**Logical Signals**		
			Signal ID	**Signal Name**	**Utilization**
			0xBF	LHN_EventInfo_St	MobileCom_Service3
			0xC0	Trailer_Settings_St	DataService6

1.4.1.24 TP-PHY-TPP-REQ-023135/B-CD - RDISP (TcSE ROIN-206152-1)

The CD – RDISP channel represent the signals connecting "AUDIO" features and "RDISP" display features. "CD" represents the Remote CD unit. RDISP represents the multimedia display unit. The RDISP device could be an MFD.

Channel					
CAN ID	**Msg Name**	**TP Index**	**Transmitter: CD** **Receiver: RDISP**		
0x2A6	CD_RDISP_WORD_Tx	34	**Logical Signals**		
			Signal ID	**Signal Name**	**Utilization**

0x52	GetFolderName_Rsp	CD
0x3D	GetMPInfo_Rsp	CD
0x3E	ActiveFolderInfo_St	CD
0x3F	AlbumName_St	CD
0x42	ArtistName_St	CD
0x43	FileName_St	CD
0x44	FolderName_St	CD
0x45	GenreName_St	CD
0x46	TrackName_St	CD
0x64	GetCDTOCData_Rsp	CD
0x76	LBP1_ItemInfo_Rsp	CD
0x79	MediaInformation_St	CD

1.4.1.25 TP-PHY-TPP-REQ-023136/A-RDISP - CD (TcSE ROIN-206153-1)

The CD – RDISP channel is representing the channel connecting "RDISP" features and "CD" features. The "RDISP" represents the multimedia display unit. The RDISP device could be a MFD or a headunit. "CD" represents the Remote CD unit.

This channel is used for Flow Control only. Requests from RDISP to CD are transferred in Single-CAN-Frames.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x2AE	CD_RDISP_WORD_RX	34

Transmitter: MFD
Receiver: CD

Logical Signals

Signal ID	Signal Name	Utilization
--	--	--

1.4.1.26 TP-PHY-TPP-REQ-092284/E-NavRepServer - NavRepClient2

The NavRepServer – NavRepClient2 channel is representing the channel connecting "Navigation Repeater Server" features and "Navigation Repeater Client2" features. The "Navigation Repeater Server" represents a navigation unit. "Navigation Repeater Client2" represents a display module.

Channel		
CAN ID	**Msg Name**	**TP Index**
0x241	NAV_RDISP2_WORD_Tx	42

Transmitter: See CAN database
Receiver: See CAN database

Logical Signals

Signal ID	Signal Name	Utilization
0x77	Destination_Info_St	Navigation
0x78	CurrentStreetName_St	Navigation
0x22	NavigationSymbolInfo_St	Navigation
0x20	StreetName_St	Navigation
0x91	UpcomingStreetName_St	Electronic Horizon
0xA8	ProjMdeNavigationRepeater_St	Projection_Mode
0xAC	StreetName2_St	Navigation
0xAD	CurrentStreetName2_St	Navigation
0xBF	LHN_EventInfo_St	MobileCom_Service3
0xE7	NavigationSymbolInfo2_St	Navigation
0xE8	DistanceToDestination2_St	Navigation

1.4.1.27 TP-PHY-TPP-REQ-092285/A-NavRepClient2 - NavRepServer

The NavRepClient2 - NavRepServer channel is representing the channel connecting "Navigation Repeater Server" features and "Navigation Repeater Client2" features. The "Navigation Repeater Server" represents a navigation unit. "Navigation Repeater Client2" represents a display module.

This channel is used for Flow control only

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x249	NAV_RDISP2_WORD_Rx	42	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
--	--	--

1.4.1.28 TP-PHY-TPP-REQ-092286/C-MediaPlayerServer - MediaPlayerClient2

The MediaPlayerServer – MediaPlayerClient2 channel is representing the channel connecting "Media Player Server" features and "Media Player Client2" features. The "Media Player Server" represents a media playback unit. "Media Player Client2" represents a Heads Up Display.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x242	CONMP_RDISP2_WORD_Tx	43	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x79	MediaInformation_St	Generic Metadata
0x67	DispInfo_ArtistName_St	SDARS
0x6C	SDARS_ChannelName_St	SDARS
0x6F	DispInfo_SongTitle_St	SDARS
0xB3	MediaInformation2_St	Generic Metadata

1.4.1.29 TP-PHY-TPP-REQ-092287/A-MediaPlayerClient2 - MediaPlayerServer

The MediaPlayerClient2 - MediaPlayerServer channel is representing the channel connecting "Media Player Server" features and "Media Player Client2" features. The "Media Player Server" represents a media playback unit. "Media Player Client2" represents a Heads Up Display.

This channel is used for Flow control only

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x24A	CONMP_RDISP2_WORD_Rx	43	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
--	--	--

1.4.1.30 TP-PHY-TPP-REQ-092288/C-PHONE - RDISP2

The PHONE – RDISP2 channel is representing the channel connecting "PHONE" features and "RDISP2 " features. The "RDISP2 " represents a Heads Up display unit. "PHONE" represents a phone interface module.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x243	PHONE_RDISP2_WORD_Tx	44	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x50	BTCallerIdentification_St	Phone
0xA7	ActiveProjectionMode_St	Projection_Mode
0xAA	ProjMdePhoneRepeater_St	Projection_Mode
0xB2	BTCallerIdentification2_St	Phone

1.4.1.31 TP-PHY-TPP-REQ-092289/A-RDISP2 - PHONE

The RDISP2 – PHONE channel is representing the channel connecting "RDISP2 " features and "PHONE" features. The "RDISP2 " represents a Heads Up display unit. "PHONE" represents a phone interface module.

This channel is used for Flow control only

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: AHUD** **Receiver: APIM**
0x24B	PHONE_RDISP2_WORD_Rx	44	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
--	--	--

1.4.1.32 TP-PHY-TPP-REQ-092294/E-MediaPlayerServer - MediaPlayerClient3

The MediaPlayerServer – MediaPlayerClient3 channel is representing the channel connecting "Media Player Server" features and "Media Player Client3" features. The "Media Player Server" represents a media playback unit. "Media Player Client3" represents a Rear display unit.

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x256	CONMP_RSE_WORD_Tx	47	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0x79	MediaInformation_St	Generic Metadata
0x67	DispInfo_ArtistName_St	SDARS
0x68	SDARS_CatName_St	SDARS
0x6C	SDARS_ChannelName_St	SDARS
0x6F	DispInfo_SongTitle_St	SDARS
0xB3	MediaInformation2_St	Generic Metadata

0x76	LBP1_ItemInfo_Rsp	List Browser Data
0xE5	SDARS_ChannelName2_St	SDARS
0xE6	SDARS_DynamicContentName_St	SDARS

1.4.1.33 TP-PHY-TPP-REQ-092295/A-MediaPlayerClient3 - MediaPlayerServer

The MediaPlayerClient3 - MediaPlayerServer channel is representing the channel connecting "Media Player Server" features and "Media Player Client3" features. The "Media Player Server" represents a media playback unit. "Media Player Client3" represents a Rear display unit.

This channel is used for Flow control only

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: See CAN database** **Receiver: See CAN database**
0x25E	CONMP_RSE_WORD_Rx	47	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
--	--	--

1.4.1.34 TP-PHY-TPP-REQ-258574/D-BLEM - APIM

The BLEM - APIM channel represent the channel connecting "BLEM" features and "APIM" features.

This channel is used for Flow control

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: BLEM** **Receiver: APIM**
0x250	RFA_BLEM_APIM_Tx	50	

Logical Signals		
Signal ID	**Signal Name**	**Utilization**
0xBA	BackupIgnition_Rsp	MobileCom_Service2 - Embedded Modem
0xB4	PaakESN_St	MobileCom_Service2 - Embedded Modem
0xDD	DigitalKeyList_Rsp	MobileCom_Service4 – NFC
0xDF	DigitalKey_Rsp	MobileCom_Service4 - NFC

1.4.1.35 TP-PHY-TPP-REQ-258575/D-APIM - BLEM

The BLEM - APIM channel represent the channel connecting "BLEM" features and "APIM" features.

This channel is used for Flow control

Channel			
CAN ID	**Msg Name**	**TP Index**	**Transmitter: APIM** **Receiver: BLEM**
0x258	APIM_RFA_BLEM_Tx	50	

Logical Signals

Signal ID	Signal Name	Utilization
0xB9	BackupIgnition_Rq	MobileCom_Service2 - Embedded Modem
0xDC	DigitalKeyList_Rq	MobileCom_Service4 - NFC
0xDE	DigitalKey_Rq	MobileCom_Service4 - NFC

1.4.1.36 TP-PHY-TPP-REQ-291029/B-APIM - ECG

The APIM – ECG channel is representing the channel connecting "ECG" features and "APIM" features.

This channel is used for Flow control

Channel

CAN ID	Msg Name	TP Index
0x2E1	APIM_ECG_Word_Tx	53

Transmitter: APIM

Receiver: ECG

Logical Signals

Signal ID	Signal Name	Utilization
0xB8	ChargeProfileLocation_Rsp	Charge_Programming_Sevice1 – Charge Programming

1.4.1.37 TP-PHY-TPP-REQ-291030/B-ECG - APIM

The ECG – APIM channel is representing the channel connecting "ECG" features and "APIM" features.

This channel is used for Flow control

Channel

CAN ID	Msg Name	TP Index
0x2E9	ECG_APIM_Word _Tx	53

Transmitter: ECG

Receiver: APIM

Logical Signals

Signal ID	Signal Name	Utilization
0xB6	ChargeProfileLocation_Rq	Charge_Programming_Sevice1 – Charge Programming

1.4.1.38 TP-PHY-TPP-REQ-404932/B-APIM - NFAM

The APIM – NFAM channel represent the channel connecting "APIM" features and "NFAM" features.

This channel is used for Flow control

Channel					
CAN ID	**Msg Name**	**TP Index**	**Transmitter: APIM** **Receiver: NFAM**		
0x293	APIM_NFAM_Tx	50	**Logical Signals**		
			Signal ID	**Signal Name**	**Utilization**
			0xDC	DigitalKeyList_Rq	MobileCom_Service4 - NFC
			0xDE	DigitalKey_Rq	MobileCom_Service4 - NFC

1.4.1.39 TP-PHY-TPP-REQ-404931/B-NFAM - APIM

The APIM – NFAM channel represent the channel connecting "APIM" features and "NFAM" features.

This channel is used for Flow control

Channel					
CAN ID	**Msg Name**	**TP Index**	**Transmitter: NFAM** **Receiver: APIM**		
0x29B	APIM_NFAM_Rx	50	**Logical Signals**		
			Signal ID	**Signal Name**	**Utilization**
			0xDD	DigitalKeyList_Rsp	MobileCom_Service4 – NFC
			0xDF	DigitalKey_Rsp	MobileCom_Service4 - NFC

1.4.2 Signal Descriptions

1.4.2.1 TP-LOG-TPL-REQ-023137/A-SID-3D-GetMPInfo_Rsp (TcSE ROIN-138040-2)

Data size: up to 949/549 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0x3D: GetMPListItemInformation_Rsp

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4-5: FolderNumber

0x0000 – Root
0x0001 – Folder number 1
0x0002 – Folder number 2
…
0xFFFF – Folder number 65535

Byte 6-7: HeaderInfo_*ItemsInFolder*

Bit 0-15: ItemsInFolder

Value: 0..65535

Byte 8: HeaderInfo_*NumberOfItems*

Bit 0-2: reserved

Bit 3-7: NumberOfItems

Value: 0..20

Byte 9 up to 948/548 (Coding Table I / Coding Table II): Item Info

Array(1.. NumberOfItems) of record (ItemIndex, ItemName, ItemSort, ItemNumber)

NOTE:
Transfer starts at ItemIndex sent in the request.
NumberOfItems value is connected to the value stated in the request.
If fewer items are available then requested, the NumberOfItems parameter in the response is set to the number of items which are available.

Record definition (47/27 (Coding Table I / Coding Table II) bytes):

Bit 0-15: ItemIndex

Value: 0..65535

Bit 16 up to 335/175: ItemName

Max. 20 characters, 19 letters plus 1 end of string character.

Bit 32/24..336/176 up to 39/31..343/183: ItemSort

0x0 – Folder
0x1 – File
0x2 – Playlist
0x3 – Videofile
0x4 – Imagefile
0x5 – reserved
…
0x7 - reserved

Bit 40/32..344/184 up to 71/63..375/215: ItemNumber

FolderNumber

0x0000 – Root
0x0001 – Folder number 1
0x0002 – Folder number 2
…
0xFFFF – Folder number 65535

TrackNumber

NOTE:
If ItemNumber is equal to Folder or Playlist the parameter TrackNumber is set to 0x0000. If ItemNumber is fordna3
equal to File, the parameter TrackNumber reflects the track number of the selected folder.

0x0001 – Track 1
0x0002 – Track 2
…
0xFFFF – Track 65535

1.4.2.2 TP-LOG-TPL-REQ-023138/A-SID-6A-EnsembleName_St (TcSE ROIN-147415-3)

Data size: up to 38/21 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x6A: EnsembleName_St

Byte 1: Utilization

0x01: Radio_Service1 – AmFm Radio General
0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4 up to 37/20 (Coding Table I / Coding Table II): Active Ensemble Name

Max. 17 characters, 16 characters plus 1 end of string character.

1.4.2.3 TP-LOG-TPL-REQ-023139/A-SID-6B-CurrentStationName_St (TcSE ROIN-147417-4)

Data size: up to 38/21 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x6B: CurrentStationName_St

Byte 1: Utilization

0x01: Radio_Service1 – AmFm Radio General
0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4 up to 37/20 (Coding Table I / Coding Table II): current station name

Max. 17 characters, 16 characters plus 1 end of string character.

1.4.2.4 TP-LOG-TPL-REQ-023140/A-SID-42-ArtistName_St (TcSE ROIN-138041-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x42: NameOfArtist_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x14: MP_Media4 – iPod
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Active artist name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.5 TP-LOG-TPL-REQ-023141/A-SID-43-FileName_St (TcSE ROIN-146556-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x43: NameOfFile_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Current file name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.6 TP-LOG-TPL-REQ-023142/A-SID-3F-AlbumName_St (TcSE ROIN-146555-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x3F: NameOfAlbum_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x14: MP_Media4 – iPod
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Current album name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.7 TP-LOG-TPL-REQ-023143/A-SID-3E-ActiveFolderInfo_St (TcSE ROIN-138042-2)

Data size: up to 44 bytes.

Byte 0: Signal identifier

0x3E: ActiveFolderInfo_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3-11: Item Info

Array(NbrOfTypes) of record (Type, NbrOfItems)
Bit 0-4: reserved

Bit 5 - 7: Type
0x0 – Folder
0x1 – File
0x2 – Playlist
0x3-0x7 – *reserved*
Bit 8-23: NbrOfItem
0x0000 – No item
0x0001 – Item 1
0x0002 – Item 2
…
0xFFFF – Item 65535

Byte 12 up to 43: Folder Path (depending onto Folder depth)

Array(ActiveFolder, Root, … way to ActiveFolder) of record (FolderNumber, ItemIndex)
Bit 0-15: FolderNumber
0x0000 – Root
0x0001 – Folder number 1
0x0002 – Folder number 2
…
0xFFFF – Folder number 65535
Bit 16-31: ItemIndex
0x0000 – Item position 0 in folder
0x0001 – Item position 1 in folder
0x0002 – Item position 2 in folder
…
0xFFFF – Item position 65535 in folder

1.4.2.8 TP-LOG-TPL-REQ-023144/A-SID-5F-GetTUPresetInfo_Rsp (TcSE ROIN-146501-5)

Data size: up to 1116/606 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x5F: GetTUPresetInfo_Rsp

Byte 1: Utilization

0x01: Radio_Service1 – AmFm Radio General
0x02: Radio_Service2 – SDARS
0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4-5: Header info

Bit 0-7: ListSize
0x00 – Invalid

0x01 – List Size 1
0x02 – List Size 2
…
0x1E – List Size 30
0xFF – No entry

NOTE: ListSize maximum is currently limited to 30 items.

Bit 8-11: reserved

Bit ~~8~~12-~~11~~15: Preset bank

0x00 – Not Valid
0x01 – Preset Bank I – FM1
0x02 – Preset Bank II – FM2
0x03 – Preset Bank III – FM3
0x04 – Preset Bank IV – FM AST
0x05 – Preset Bank V – AM
0x06 – Preset Bank VI – AM AST
~~0x07 – Reserved – Reserved~~
0x07 – Preset Bank XII – DAB3
0x08 – Preset Bank VII – DAB1
0x09 – Preset Bank VIII – DAB2
0x0A – Preset Bank IX – SAT1
0x0B – Preset Bank X – SAT2
0x0C – Preset Bank XI – SAT3

~~*Bit 12-15: reserved*~~

Byte 6 up to 1115/605 (Coding Table I / Coding Table II): Preset Info

NOTE: Transfer starts at Preset number sent in the request
***N** is also stated in the request. If **N** is greater than ListSize, the complete list will be transferred.*

Array (1...N) of record (PresetNumber, Frequency, Station Name,)
Record definition (37/20 (Coding Table I / Coding Table II) bytes):

Byte 0: PresetNumber

0x00 – Reserved
0x01 – Preset 1
0x02 – Preset 2
...
0x1E – Preset 30
0xFF – No valid preset

Byte 1-2: Frequency

0x0000 – 0
0x0001 – 1
…
0x0615 – 1557
0x0616 – Reserved
…
0xFFFF – Reserved

AM: Freq = 153+ Offset kHz. Offset 0..1557
*FM: Freq = 76+ Offset*0.05 MHz. Offset 0..640*
Selected tuned band determine frequency (kHz or MHz).
SDARS: ChanNum = xxx (range = 000 – 223)
DAB: frequency/BlockNumber = Bitfield:
Bit 0 .. 4:
L-Band Canada: Numeric value(1 .. 23);

L-Band Europe: Numeric value(A=1 .. W=23);
Band III: Numeric value(A=1 .. W=23); hex coded
Bit 5 .. 8:
Band III: Numeric value (not used for L-Band; default value: 0h), hex coded
Bit 9:
0: Band III, 1: L-Band

Byte 3 up to 36/19 (Coding Table II / Coding Table I): Station Name
Up to 17 characters 16 letters plus 1 End Of String character

NOTE: If the Station Name is shorter than 16 characters, it must be terminated with an End Of String.
PSName = 8 Characters Max

DAB Service Name = 16 Characters Max

HD Station Name = 16 Characters Max
~~*HD Station Name = (SSN) -HD(n)*~~
~~*SSN = 4 Characters Max*~~
~~*n = Multicast channel number*~~

SDARS Channel name = Short name
Short Name = 8 Characters Max

1.4.2.9 TP-LOG-TPL-REQ-023145/A-SID-60-GetStationList_Rsp (TcSE ROIN-146502-6)

Data size: up to 1178/668 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x60: GetStationList_Rsp

Byte 1: Utilization

0x04: Radio_Service4 – Dynamic Station List

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4-7: Header info

Bit 0: Refresh flag
$0: False
$1: True

NOTE: Refresh Flag shall always be set to 0x1 for Single Tuners.

Bit 1-4: reserved

Bit 5 - 7: StationList
0x0 – Invalid

0x1 – Analog AM List
0x2 – Analog FM List
0x3 – FM HD List
0x4 – Analog and HD FM List
0x5 – Analog FM PTY List
0x6 – DAB Ensemble Service List
0x7 – DAB Service List

Bit 8-15: ListSize

0x00 – Invalid
0x01 – Item 1
0x02 – Item 2
…
0xFD – Item 253
0xFE – Not Used
0xFF – No entry

NOTE: The parameter List Size defines how many list items are transmitted in the response. ListSize maximum is currently limited to 30 items.

Bit 16-23: TotalNumOfStatAval

0x00 – Invalid
0x01 – Item 1
0x02 – Item 2
…
0xFD – Item 253
0xFE –Not Used
0xFF – No entry

Bit 24 – 25: reserved

Bit 26 - 31: Requested PTY

0x00 – Invalid
0x01 – PTY Code
0x02 – PTY Code
…
0x1F – PTY Code

NOTE: If parameter StationList = 0x5-0x7 or 0x1 then Requested PTY = 0x0, else PTY = 0x00 ... 0x1F. For parameter StationList = 0x2 with FM RDS the Requested PTY = 0x0.

Byte 8 up to 1177/667 (Coding Table I / Coding Table II): ItemVector

NOTE: Transfer starts at Index Number sent in the request.
***N** is also stated in the request. If **N** is greater than ListSize, the complete list will be transferred.*

Array (1...N) of record (IndexNumber, Frequency, HDMulticast, TP Status, TMC Status, Program Type, Station Name)
Record definition (39/22 (Coding Table I / Coding Table II) bytes):

Bit 0-7: IndexNumber

0x00 – Reserved
0x01 – Index 1
0x02 – Index 2
...
0xFE – Ensemble Name
0xFF – Invalid

Bit 8-23: Frequency

0x000 – 0
0x001 – 1

…
0x615 – 1557
0x616 – reserved
…
0xFFFF – reserved

AM: Freq = 153+ Offset kHz. Offset 0..1557
*FM: Freq = 76+ Offset*0.05 MHz. Offset 0..640*
Selected tuned band determine frequency (kHz or MHz).
DAB: frequency/BlockNumber = Bitfield:
Bit 0 .. 4:
L-Band Canada: Numeric value (1 .. 23);
L-Band Europe: Numeric value (A=1 .. W=23);
Band III: Numeric value (A=1 .. W=23); hex coded
Bit 5 .. 8:
Band III: Numeric value (not used for L-Band; default value: 0h), hex coded
Bit 9:
0: Band III, 1: L-Band

NOTE: If Station List is 0x5 the parameter Frequency will contain the total number of stations available in a particular PTY.

Bit 24-29: HDMulticast
0x00 – Not Applicable
0x01 – MC 1
0x02 – MC 2
0x03 – MC 3
0x04 – MC 4
0x05 – MC 5
0x06 – MC 6
0x07 – MC 7
0x08 – PTY List
0x09 – reserved
…
0x3F reserved

Bit 30: TPStatus:
0x0: not available
0x1: available

Bit 31: TMCStatus:
0x0: not available
0x1: available

Bit 32-33: reserved
Bit 34 - 39: Program Type:
0x00 – Invalid
0x01 – PTY1
0x02 – PTY 2
…
0x1F – PTY31

Bit 40 up to 312/176 (Coding Table II / Coding Table I): Station Name
Up to 17 characters 16 letters plus 1 End Of String character

NOTE: If the Station Name is shorter than 16 characters, it must be terminated with an End Of String character.
PSName = 8 Characters Max

DAB Service Name = 16 Characters Max
DAB Ensemble Name = 16 Characters Max

HD Station Name = (SSN)
SSN = 4 Characters Max

SDARS Channel name = Short name
Short Name = 8 Characters Max

1.4.2.10 TP-LOG-TPL-REQ-023146/A-SID-44-FolderName_St (TcSE ROIN-146557-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x44: NameOfFolder_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Current folder name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.11 TP-LOG-TPL-REQ-023147/A-SID-45-GenreName_St (TcSE ROIN-146558-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x45: NameOfGenre_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x14: MP_Media4 – iPod
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Active genre name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.12 TP-LOG-TPL-REQ-023148/A-SID-46-TrackName_St (TcSE ROIN-146559-2)

Data size: up to 44/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x46: NameOfTrack_St

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x14: MP_Media4 – iPod
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II

0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 43/23 (Coding Table I / Coding Table II): Current track name

Max. 20 characters, 19 characters plus 1 end of string character.

1.4.2.13 TP-LOG-TPL-REQ-023149/A-SID-3B-RadioText_St (TcSE ROIN-138038-3)

Data size: up to 134/69 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x3B: RadioText_St

Byte 1: Utilization

0x01: Radio_Service1 – AmFm Radio General
0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4 up to 133/68: (Coding Table I / Coding Table II): ItemName

Max. 65 characters, 64 characters plus 1 end of string character.

1.4.2.14 TP-LOG-TPL-REQ-023150/A-SID-52-GetFolderName_Rsp (TcSE ROIN-138039-2)

Data size: up to 46/26 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0x52: GetMPFolderName_Rsp

Byte 1: Utilization

0x11: MP_Media1 – CD
0x12: MP_Media2 – BT Audio Streaming
0x13: MP_Media3 – USB
0x15: MP_Media5 – SD
0x16: MP_Media6 – DVD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)

0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4-5: FolderNumber

0x0000 – Root
0x0001 – Folder number 1
0x0002 – Folder number 2
…
0xFFFF – Folder number 65535

Byte 6 up to 45/25 (Coding Table I / Coding Table II): ItemName

Max. 20 characters, 19 characters plus 1 end of string character.

NOTE:
In case of Root, EOS is sent as ItemName, display units to show the HMI defined equivalent of 'Root'.

1.4.2.15 TP-LOG-TPL-REQ-023151/A-SID-63-GetTagInfo_Rsp (TcSE ROIN-146549-2)

Data size: up to 1178/668 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x63: GetTagInfo_Rsp

Byte 1: Utilization

0x05: Radio_Service5 – Radio Tagging

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 1101/556 (Coding Table I / Coding Table II): Tag Info

Time Stamp
Fix 4 byte
Format is binary - ALFN(Time Stamp)

Time Lock Status
Fix 1 byte
0x0 - Time Lock not Set
0x1 - Time Lock Set
0xFF - (ALFN invalid)

Program Number
Fix 1 byte
0x1 - Multicast 1
0x2 - Multicast 2
0x3 - Multicast 3
0x4 - Multicast 4
0x5 - Multicast 5

0x6 - Multicast 6
0x7 - Multicast 7
0xFF - Invalid or Empty

Ambiguous Data Flag
Fix 1 byte
0x00 - Not Ambiguous
0x01 - Ambiguous
0xFF - Invalid or Empty

Button Press Flag
Fix 1 byte
0x00 - No
0x01 - Yes
0xFF - Invalid or Empty

Note: The following fields shall support Coding Table I & II

Title
Max. 65 Characters, 64 letters plus 1 EOS
If Invalid or Empty set to 0x00

Artist
Max. 65 Characters, 64 letters plus 1 EOS
If Invalid or Empty set to 0x00

Album
Max. 65 Characters, 64 letters plus 1 EOS
If Invalid or Empty set to 0x00

UFID Owner Identifier
Max. 129 Characters, 128 letters plus 1 EOS
If Invalid or Empty set to 0x00

UFID Identifier
Max. 65 Characters, 64 letters plus 1 EOS
If Invalid or Empty set to 0x00

Station Call Sign
Max. 17 Characters, 16 letters plus 1 EOS
If Invalid or Empty set to 0x00

Station Frequency
Max. 10 Characters, 9 letters plus 1 EOS
If Invalid or Empty set to 0x00

Genre
Max. 129 Characters, 128 letters plus 1 EOS
If Invalid or Empty set to 0x00

1.4.2.16 TP-LOG-TPL-REQ-023152/A-SID-64-GetCDTOCData_Rsp (TcSE ROIN-146682-2)

Data size: up to 1024 (Coding Table II) bytes

Byte 0: Signal identifier

0x64: GetCDTOCData_Rsp

Byte 1: Utilization

0x11: MP_Media1 – CD

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 1023 (Coding Table II Only): CD TOC Data

Array(1..MaxTOC) of record (ItemIndex, TOCItem)

Record definition (up to 1020 (Coding Table II) bytes):

Byte 0: ItemIndex
0x00..0xFF

Byte 1 – Byte 3: TOCItem
0x00..0xFFFFFF

1.4.2.17 TP-LOG-TPL-REQ-023153/A-SID-67-DispInfo_ArtistName_St (TcSE ROIN-146770-5)

Max Data size: up to 134/69 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x67: DispInfo_ArtistName_St

Byte 1: Utilization

0x02: Radio_Service2 – SDARS
0x06: Radio_Service6 – HD Radio

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

If Utilization = 0x02:

Byte 4 up to 93/48 (Coding Table I / Coding Table II):

AID
Fixed 8 ~~bytes~~characters

Artist Name
Max. 37 characters, 36 characters plus 1 end of string character.

If Utilization = 0x06:

Byte 4 up to 133/68 (Coding Table I / Coding Table II):
Artist Name
Max. 65 characters, 64 characters plus 1 end of string character.

1.4.2.18 TP-LOG-TPL-REQ-023154/A-SID-68-SDARS_CatName_St (TcSE ROIN-146772-3)

Data size: up to 56/30 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier
0x68: SDARS_CatName_St

Byte 1: Utilization
0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 55/29 (Coding Table I / Coding Table II):
GCI Category Long Name
Max. 17 characters, 16 characters plus 1 end of string character.

GCI Category Short Name
Max. 9 characters, 8 characters plus 1 end of string character.

1.4.2.19 TP-LOG-TPL-REQ-023155/A-SID-6C-SDARS_ChannelName_St (TcSE ROIN-146811-3)

Data size: up to 64/34 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier
0x6C: SDARS_ChannelName_St

Byte 1: Utilization
0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I

0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 63/33 (Coding Table I / Coding Table II):

GCI Channel Long Name
Max. 21 characters, 20 characters plus 1 end of string character.

GCI Channel Short Name
Max. 9 characters, 8 characters plus 1 end of string character.

1.4.2.20 TP-LOG-TPL-REQ-023156/A-SID-6F-DispInfo_SongTitle_St (TcSE ROIN-146818-5)

Max Data size: up to 134/69 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x6F: DispInfo_SongTitle_St

Byte 1: Utilization

0x02: Radio_Service2 – SDARS
0x06: Radio_Service6 – HD Radio

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

If Utilization = 0x02:

Byte 4 up to 93/48 (Coding Table I / Coding Table II):

PID
Fixed 8 ~~bytes~~characters

Song Title
Max. 37 characters, 36 characters plus 1 end of string character.

If Utilization = 0x06:

Byte 4 up to 133/68 (Coding Table I / Coding Table II):
Song Title
Max. 65 characters, 64 characters plus 1 end of string character.

1.4.2.21 TP-LOG-TPL-REQ-023157/A-SID-66-SDARS_Alert_St (TcSE ROIN-146819-3)

Data size: up to 95/50 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x66: SDARS_Alert_St

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 94/49 (Coding Table I / Coding Table II):

Alert ID (PID or AID)
Fixed 8 bytes

Channel Number
Fixed 1 Byte
0x00…0xFF

Alert Text (Song Title or Artist Name)
Max. 37 characters, 36 characters plus 1 end of string character.

1.4.2.22 TP-LOG-TPL-REQ-023158/A-SID-65-SDARS_SetAlert_Rq (TcSE ROIN-147030-3)

Data size: up to 1667/927 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x65: SDARS_SetAlert_Rq

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x00: INVALID/INACTIVE

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCode

Bit 0-7:OpCode

0x0: Reserved
0x1: Read
0x2: Add Song
0x3: Add Artist
0x4: Delete
0x5: Delete All
...

0x6..0xFF: Reserved

Byte 5: NumberOfItems

0x00: DELETE/DELETE ALL
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 6: StartIndex

0x00: DELETE/DELETE ALL
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 7 up to 1666/926 (Coding Table I/Coding Table II): Alert Data

Array(1..NumberOfItems) of record (ItemIndex, ID, PDT_Text)

Record definition (up to 1660/920 (Coding Table I/Coding Table II) bytes):

Byte 0: ItemIndex
0x00..0xFF

Byte 1 to Byte 8: PID/AID
Fixed 8 Bytes

PID/AID = Max. 8 characters

Byte 9 up to Byte 82/45: PDT_Text (Song Title/Song Artist)
Max. 36 characters plus 1 End Of String

***Note**: Maximum number of alerts that can be added is limited to 20.*

Notes:
IF Opcode = READ, Then IndexNum = 0x00, ID = 0x00, Text = 0x00

IF Opcode = ADD SONG, Then IndexNum = StartIndex, ID = PID, Text = PDT Song Title

IF Opcode = ADD ARTIST, Then IndexNum = StartIndex, ID = AID, Text = PDT Artist Name

IF Opcode = DELETE,
Then IndexNum = 0x00, ID = PID/AID, Text = 0x0

IF Opcode = DELETE ALL, Then IndexNum = 0x0, ID = 0x0, Text = 0x0

1.4.2.23 TP-LOG-TPL-REQ-023159/A-SID-6D-SDARS_CurrentCatList_Rsp (TcSE ROIN-147071-3)

Data size: up to 3307/1747 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x6D: SDARS_CurrentCatList_Rsp

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: Max number of items returned is limited to 60.*

Byte 5: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 6: ItemsInList

0x00: Reserved
0x01: Items Available 1
0x02: Items Available 2
....
0xFE: Items Available 254
0xFF: No Entry

Byte 7 up to 3306/1746 (Coding Table I/Coding Table II): Channel Info

Array(1..NumberOfItems) of record (ItemIndex, CategoryNumber, ChannelsInCategory, Short Category Name, Long Category Name)

Record definition (up to 55/29 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex
0x00..0xFF

Byte 1: CategoryNumber:
0x00: All
0x01: Category 1
…
0xF9: Category 249
0xFA...0xFE: Reserved
0xFF: Invalid

Byte 2: ChannelsInCategory:
0x00: Invalid

0x01: Channels Available 1
0x02: Channels Available 2
…
0xFE: Channels Available 254
0xFF: No Entry

Note:
ChannelsInCategory = 0x00:Invalid when there are not channels available in a respective category.
ChannelsInCategory = 0xFF:NoEntry for a category number that is out of range.

Byte 3 up to Byte 54/28 (Coding Table I/Coding Table II)

Short Category Name
Max. 8 characters plus 1 End Of String

Long Category Name
Max. 16 characters plus 1 End Of String

Note: *Both Long and Short Category names will be sent. The HMI will decide which to display.*

1.4.2.24 TP-LOG-TPL-REQ-023160/A-SID-6E-SDARS_SetAlert_Rsp (TcSE ROIN-147072-3)

Data size: up to 1668/928 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x6E: SDARS_SetAlert_Rsp

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RspCode

0x0: Reserved
0x1: Already Saved
0x2: Memory Full
0x3: List Info
0x4: Added Song
0x5: Added Artist
0x6: Deleted
0x7: All Deleted
...
0x8..0xFF: Reserved

Byte 5: NumberOfItems

0x00: Reserved
0x01: 1

0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: If RspCode = List Info, then Maximum number of alerts that can be returned is limited to 20.*

Byte 6: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 7: ItemsInList

0x00: Reserved
0x01: Items Available 1
0x02: Items Available 2
....
0xFE: Items Available 254
0xFF: No Entry

Byte 8 up to 1667/927 (Coding Table I/Coding Table II): Channel Info

Array(1..NumberOfItems) of record (ItemIndex, ID, PDT Text)

Record definition (up to 1660/920 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex
0x00..0xFF

Byte 1 to Byte 8: PID/AID
Fixed 8 Bytes
Max. 8 characters

Byte 9 up to Byte 82/45: PDT_Text (Song Title/Song Artist)
Max. 36 characters plus 1 End Of String

1.4.2.25 TP-LOG-TPL-REQ-023161/A-SID-62-SSP_Rsp (TcSE ROIN-147238-2)

Data size: up to 4096 (Coding Table II Only) bytes

Byte 0: Signal identifier

0x62: SSP_Rsp

Byte 1: Utilization

0x71: Data_Service1 – SSP Data Service

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I

0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RspCode

0x0 - Invalid
0x1 - Data Channel Status
0x2 - decoder_path_id
0x3 - SSP Rsp Packet
0x4..0xFF: Reserved

Byte 5: ChannelStatus

When RspCode = 0, this parameter = 0x0

When RspCode = 1, this parameter contains the status of the data channel:

0x0 = Initializing channel

0x1 = Channel Closed

0x2 = Channel Open

When RspCode = 2 or 3, this parameter = 0x2.

Byte 6: decoder_path_id

When RspCode = 0 or 1, this parameter is NULL (0x00)

When RspCode = 0x2 or 0x3, this parameter contains the decoder_path_id.

Byte 7 up to Byte 4095: SSP_Packet *(Coding Table II Only)*

When RspCode = 0 or 1 or 2, this parameter is NULL (0x00)

When RspCode = 0x3, this parameter contains the SSP response packet.

Note: *SSP packet definitions are defined in the SSP specifications*

1.4.2.26 TP-LOG-TPL-REQ-023162/A-SID-61-SSP_Rq (TcSE ROIN-147239-3)

Data size: up to 4096 (Coding Table II Only) bytes

Byte 0: Signal identifier

0x61: SSP_Rq

Byte 1: Utilization

0x71: Data_Service1 – SSP Data Service

Byte 2: Command Execution Status

0x00: Invalid/Inactive

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RqCode

0x0 - Invalid
0x1 - Query Data Channel Status
0x2 - Query decoder_path_id

0x3 - SSP Req Packet
0x4..0xFF: Reserved

Byte 5 up to Byte 4095: SSP_Packet *(Coding Table II Only)*

When RspCode < 3 this parameter is NULL (0x00)

When RspCode = 0x3, this parameter contains the SSP command packet.

Note: *SSP packet definitions are defined in the SSP specifications*

1.4.2.27 TP-LOG-TPL-REQ-023163/A-SID-80-ChannelInfo_Rq (TcSE ROIN-167434-2)

Data size: up to 516 (Coding Table III) bytes

Byte 0: Signal identifier

0x80: ChannelInfo_Rq

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x00: INVALID/INACTIVE

Byte 3: Character Coding

Bit 0-5: reserved

Bit 6-7: Coding

0x2: Coding Table III
0x00-0xFF Hexadecimal Notation

Byte 4: OpCode

Bit 0-7:OpCode

0x0: Reserved
0x1: Read
0x2: Lock
0x3: Unlock
0x4: Skip
0x5: Clear Skip
0x6: Skip List
0x7: PID Request
...
0x8..0xFF: Reserved

Byte 5: Category

0x00: All
0x01: Category1
0x02: Category2
0x03: Category3
…
0xF9: Category249
0xFA: Sirius 1
0xFB: Sirius 2
0xFC: Sirius 3
0xFD: Reserved
0xFE: Reserved
0xFF: Invalid

Note*: If Opcode = Lock/Unlock/Skip/Skip Clear/Skip List, then Category = FF*
If Opcode = PID Request, then Category = All

Byte 6: StartIndex

0x00: Invalid
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: If Opcode = LOCK/UNLOCK/SKIP/SKIP CLEAR/SKIP LIST/PID REQUEST, Then StartIndex = 00*

Byte 7: NumberOfItems

0x00: Invalid
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: If NumberOfItems exceeds amount of items available, the maximum number of items available will be returned*

Byte 8 up to 515 (Coding Table III): Alert Data

Array(1..NumberOfItems) of record (Channel Number, Lock Status, Skip Status)

Record definition (up to 254 (Coding Table III) bytes):

Byte 0: Channel Number
0x00..0xFF

Byte 1/Bit 0-3: Lock Status
0x00: Invalid
0x01: Locked
0x02: Unlocked

Byte 1/Bits 4-7: Skip Status
0x00: Invalid
0x01: Skipped
0x02: Cleared Skip

Notes:
If Opcode = READ,
Then Channel Number = 0x00, Lock Status = 0x00, Skip Status = 0x00

If Opcode = LOCK,
Then Channel Number = Channel Number, Lock Status = 0x01, Skip Status = 0x00

If Opcode = UNLOCK,
Then Channel Number = Channel Number, Lock Status = 0x02, Skip Status = 0x00

If Opcode = SKIP,
Then Channel Number = Channel Number, Lock Status = 0x00, Skip Status = 0x01

If Opcode = SKIP CLEAR,
Then Channel Number = Channel Number, Lock Status = 0x00, Skip Status = 0x02

If Opcode = SKIP LIST,
Then Channel Number = 0x00, Lock Status = 0x00, Skip Status = 0x00

If Opcode = PID REQUEST,
Then Channel Number = 0x00, Lock Status = 0x00, Skip Status = 0x00

1.4.2.28 TP-LOG-TPL-REQ-023164/A-SID-69-SDARS_ChannelInfo_Rsp (TcSE ROIN-147031-3)

Data size: up to 3369 (Coding Table II) bytes

Byte 0: Signal identifier

0x69: SDARS_ChannelInfo_Rsp

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RspCode

Bit 0-7:RspCode
0x0: Reserved
0x1: List Info
0x2: Locked
0x3: Unlocked
0x4: Skipped
0x5: Skip Cleared
0x6: Skip List
0x7: PID Request
...
0x8..0xFF: Reserved

Byte 5: Category

0x00: All
0x01: Category 1
0x02: Category 2
....
0xF9: Category 249
0xFA: Sirius 1
0xFB: Sirius 2
0xFC: Sirius 3
0xFD…0xFF: Reserved

***Note**:*
If RspCode = Locked/Unlocked/Skipped/Skip Cleared/Skip List, Then Category = FF

If RspCode = PID REQUEST, then Category = All

Byte 6: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Note: *If RspCode = List Info, Then the max number of items returned is limited to 18.*

Note: *If NumberOfItems exceeds amount of items available, the maximum number of items available will be returned.*

Byte 7: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 8: ItemsInCategory

0x00: Reserved
0x01: Items Available 1
0x02: Items Available 2
....
0xFE: Items Available 254
0xFF: No Entry

Note*: If RspCode = Locked/Unlocked/Skipped/Skip Cleared/Skip List, Then ItemsInCategory = FF*

Byte 9 up to 3368 (Coding Table II): Channel Info

Note*: If RspCode = List Info, Then the max number of items returned is limited to 18.*

Array(1..NumberOfItems) of record (ItemIndex, Channel Number, Lock Status, Skip Status, PID, Short Channel Name, Long Channel Name, Song Artist, Song Title)

Record definition (up to 115 (Coding Table II) bytes):
Byte 0: ItemIndex
0x00..0xFF

Byte 1: Channel Number:
0x00 ....0xFF

Byte 2/Bits 0-3: Lock Status:
0x00: Invalid
0x01: Locked
0x02: Unlocked

Byte 2/Bits 4-7: Skip Status:
0x00: Invalid
0x01: Skipped
0x02: Cleared skip

Byte 3 to Byte 10: PID
Fixed 8 bytes
8 Characters

Byte 11 up to 114 (Coding Table II)

Short Channel Name
Max. 8 characters plus 1 End Of String

Long Channel Name
Max. 20 characters plus 1 End Of String

Note: *Both Long and Short channel names will be sent. The HMI will decide which to display.*

Song Artist:
Max. 36 characters plus 1 End Of String

Song Title:
Max. 36 characters plus 1 End Of String

Notes:
If RspCode = List Info, Then
Channel Number = Chan. Num.
Channel Name = Chan. Name
Song Artist = Song Artist
Song Title = Song Title
Lock Status = Lock Status
Skip Status = Skip Status
PID = PID

If RspCode = Locked, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = 0x01
Skip Status = 0x00
PID = 0x00

If RspCode = Unlocked, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = 0x02
Skip Status = 0x00
PID = 0x00

If RspCode = Skipped, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = 0x00
Skip Status = 0x01
PID = 0x00

If Opcode = Skip Cleared, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = 0x00

Skip Status = 0x02
PID = 0x00

If Opcode = Skip List, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = 0x00
Skip Status = Skip Status
PID = 0x00

If Opcode = PID REQUEST, Then
Channel Number = Chan. Num.
Channel Name = 0x00
Song Artist = 0x00
Song Title = 0x00
Lock Status = Lock Status
Skip Status = Skip Status
PID = PID

1.4.2.29 TP-LOG-TPL-REQ-023165/B-SID-70-AHU_Bezel_Diag_Data (TcSE ROIN-147284-2)

Data size: up to 73 (Coding Table II Only) bytes

Byte 0: Signal identifier

0x70: AHU_Bezel_Diag_Data

Byte 1: Utilization

0x72: Data_Service2 – Component Diagnostic Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Bezel_Diag_Operation

0x0 Inactive
0x1 Get All Background Request
0x2 Software Part Number
0x3 Hardware Part Number
0x4 Calibration Part Number
0x5 Speaker Walk-Around
0x6 SDARS ESN Number
0x7 Signal Strength
0x8..0xFF: Reserved

Byte 5 up to Byte 72: Bezel Diagnostic Data *(Coding Table II Only)*

Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

Note: *When Bezel_Diag_Operation = 0x2 then the data will be for the Software Part Number*

When Bezel_Diag_Operation = 0x3 then the data will be for the Hardware Part Number

When Bezel_Diag_Operation = 0x4 then the data will be for the Calibration Part Number

When Bezel_Diag_Operation = 0x5 then the data will be for the Speaker Walk-Around test

When Bezel_Diag_Operation = 0x6 then the data will be for the SDARS ESN Number

When Bezel_Diag_Operation = 0x7 then the data will be for the radio signal strength test

Note: If Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:
Software Part Number
Max 24 characters + 1 EOS

Hardware Part Number
Max 24 characters + 1 EOS

Calibration Part Number
Max 24 characters + 1 EOS

SDARS ESN Number
Max 24 characters + 1 EOS

1.4.2.30 TP-LOG-TPL-REQ-023166/B-SID-71-EFP_Bezel_Diag_Data (TcSE ROIN-147292-2)

Data size: up to 56 (Coding Table II Only) bytes

Byte 0: Signal identifier

0x71: EFP_Bezel_Diag_Data

Byte 1: Utilization

0x72: Data_Service2 – Component Diagnostic Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Bezel_Diag_Operation

0x0 Inactive
0x1 Get All Background Request
0x2 Software Part Number
0x3 Hardware Part Number
0x4 Calibration Part Number
0x5..0xFF: Reserved

Byte 5 up to Byte 55: Bezel Diagnostic Data *(Coding Table II Only)*

Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

> ***Note:*** *When Bezel_Diag_Operation = 0x2 then the data will be for the Software Part Number*
>
> *When Bezel_Diag_Operation = 0x3 then the data will be for the Hardware Part Number*
>
> *When Bezel_Diag_Operation = 0x4 then the data will be for the Calibration Part Number*

Note: If Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:

Software Part Number
Max 24 characters + 1 EOS

Hardware Part Number
Max 24 characters + 1 EOS

Calibration Part Number
Max 24 characters + 1 EOS

1.4.2.31 TP-LOG-TPL-REQ-015147/B-SID-72-DSP_Bezel_Diag_Data (TcSE ROIN-147293-2)

Data size: up to 56 (Coding Table II Only) bytes

Byte 0: Signal identifier

0x72: DSPAMP_Bezel_Diag_Data

Byte 1: Utilization

0x72: Data_Service2 – Component Diagnostic Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Bezel_Diag_Operation

0x0 Inactive
0x1 Get All Background Request
0x2 Software Part Number
0x3 Hardware Part Number
0x4 Calibration Part Number
0x5 Speaker Walk-Around
0x6..0xFF: Reserved

Byte 5 up to Byte 55: Bezel Diagnostic Data *(Coding Table II Only)*

Max 24 characters + 1 EOS for any Bezel Diagnostic Operation

> ***Note:*** *When Bezel_Diag_Operation = 0x2 then the data will be for the Software Part Number*

When Bezel_Diag_Operation = 0x3 then the data will be for the Hardware Part Number

When Bezel_Diag_Operation = 0x4 then the data will be for the Calibration Part Number

When Bezel_Diag_Operation = 0x5 then the data will be for the Speaker Walk-Around test

Note: If Bezel_Diag_Operation = 0x1 Get All Background Request then the following diagnostic operation data will be sent in this order:
Software Part Number
Max 24 characters + 1 EOS

Hardware Part Number
Max 24 characters + 1 EOS

Calibration Part Number
Max 24 characters + 1 EOS

1.4.2.32 TP-LOG-TPL-REQ-023167/A-SID-73-SDARS_ESN_St (TcSE ROIN-159079-2)

Data size: up to 28/16 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x73: SDARS_ESN_St

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 27/15 (Coding Table I / Coding Table II):

ESN
Fixed 12 bytes

1.4.2.33 TP-LOG-TPL-REQ-023168/A-SID-74-TMCData_St (TcSE ROIN-159081-4)

Data size: up to 26 byte

Byte 0: Signal identifier

0x74: TMCData_St

Byte 1: Utilization

0x73: Data_Service3 – TMC Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information

0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: NbrOfGroups

Bit 0-4: Reserved
Bit 5-7: NbrOfGroups
0x0: not used
0x1 – 0x5: NbrOfGroups
0x6 – 0x7: Reserved

Byte 5: Dynamization Information

Bit 0-2: Duration Persistence
0x0 – 0x7: Numeric Duration Code
Bit 3: Diversion Advice
0x0: no diversion recommended
0x1: diversion recommended
Bit 4: Direction
0x0: positive
0x1: negative
Bit 5-7: Extent
0x0 – 0x7: Numeric Extent Code

Byte 6-7: Event

Bit 0-4: Reserved
Bit 5-15: Event Code
0x000 – 0x7FF: Numeric Event Code

Byte 8-9: Location

0x0000 – 0xFFFF: Numeric Location Code

Byte 10 up to 25: OptMsgContent

Array (2.. NbrOfGroups) of Record (Y-FreeFormat, Z-FreeFormat)
Record definition (4 byte)
Byte 0-1: Y-FreeFormat:
Bit 0-3: Reserved
Bit 4-15: Y11 up to Y0 Free Format

Byte 2-3: Z-FreeFormat:
Bit 0-15: Z15 up to Z0 Free Format

Free Format: The Free Format used within the OptMsgContent Array must be filled with data as described in the ISO-14819-1 TMC specification.

1.4.2.34 TP-LOG-TPL-REQ-023169/C-SID-76-LBP1_ItemInfo_Rsp (TcSE ROIN-159709-6)

Data size: up to Variable (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x76: LBP1_ItemInfo_Rsp

Byte 1: Utilization

0x01 Radio_Service1 – Radio General (AM, FM, AST, DAB, SDARS)
0x02 Radio_Service2 – SDARS
0x03 Radio_Service3 – DAB

0x11 MP_Media1 – CD
0x12 MP_Media2 – BT Audio Streaming
0x13 MP_Media3 – USB
0x14 MP_Media4 – iPod
0x17 MP_Media7 – Generic Metadata

0x22 Nav_Service2 – Navigation

0x31 MobileCom_Service1 – Mobile Phone

0x74: DataService4 – List Browser Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCodeRsp:

Bit 0-5: reserved

Bit 6 - 7: OpCodeRsp

0x0: Inactive
0x1: GetItemInfoRsp
0x2: SetItemInfoRsp
0x3: Reserved

Byte 5: *RspListServ :*

0x00: Inactive
0x01: ServerID_1
...
0xFF: Reserved

Byte 6-7: ActiveListID

0x0000: Root
0x0001: ListID_1
0x0002: ListID_2
....
0xFFFE:
0xFFFF: Reserved

Byte 8-9: ParentListID

0x0000: Root
0x0001: ListID_1
0x0002: ListID_2
....

0xFFFE:
0xFFFF: Reserved

Byte 10: NbrOfItemsRtn

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: Reserved

Byte 11-12: NbrOfItemsInSelection

0x0000: Reserved
0x0001:
0x0002:
....
0xFFFE:
0xFFFF:

Byte 13 up to Variable (Coding Table I/Coding Table II): Channel Info

Array(1..NumberOfItemsRtn) of record (ItemIndex, DataType, ObjectType, ObjectState, ActivationEvent, ItemDescriptor)

Record definition (up to Variable (Coding Table I/Coding Table II) bytes):
Byte 0-1: ItemIndex
0x0000: List Label
0x0001
..
0xFFFF

Byte 2: DataType
0x00
0x01
..
0xFF

Byte 3:
Bit 0 - 1: Reserved
Bit 2 - 3: *ObjectType*
0x0: List Label
0x1: Entry ~~List~~
0x2: List~~Entry~~
Bit 4 - 5: *ObjectState*
0x0: Inactive
0x1: Active
Bit 6 - 7: *ActivationEvent*
0x0: Not Supported
0x1: Supported

Byte 4 up to Byte Variable: ItemDescriptor
{Descriptor Tag} – Refer to descriptor table and DataType.

1.4.2.35 TP-LOG-TPL-REQ-023170/A-SID-20-StreetName_St (TcSE ROIN-138045-3)

Data size: up to 45/24 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x20: StreetName_St

Byte 1: Attribute

Bit 0-5: reserved

Bit 6 - 7: Text alignment

0x0 – centered
0x1 – left aligned
0x2 – right aligned

NOTE:
The text alignment bit can only be used for Gen2 systems

Byte 2: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3 up to 44/23 (Coding Table I / Coding Table II): StreetName

Max. 21 characters, 20 characters plus 1 end of string character

1.4.2.36 TP-LOG-TPL-REQ-023171/B-SID-0D-Initiate_BTCall_Rq (TcSE ROIN-138053-3)

Data size: up to 27 byte.

Byte 0: Signal identifier

0x0D: InitiateBTCall_Rq

Byte 1: Call Info

Bit 0-4: Reserved

Bit 5 - 7: TypeOfCall

0x1 – Telephony Call
0x2 – Last Incoming Call
0x3 – Last Outgoing Call
0x4 – Last Missed Call
0x5 – Redial

Byte 2 up to 26: TelephoneNumber Coding Table II fixed

Max. 25 characters, 24 characters plus 1 end of string.

1.4.2.37 TP-LOG-TPL-REQ-023172/A-SID-78-CurrentStreetName_St (TcSE ROIN-160690-3)

Data size: up to 46/26 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x78: CurrentStreetName_St

Byte 1: Utilization

0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 45/25 (Coding Table I / Coding Table II):

Byte 1:

Bits 0-3: Reserved

Bits 4 - 7: DataUpdate
0x0 Inactive
0x1 Set Operation
0x2 Data refresh

Byte 2: SpeedLimit
0x00 Invalid
0x01 1
...
0xFF 255

Byte 3: *CurentStreetName*
19 characters max plus 1 end of string character

1.4.2.38 TP-LOG-TPL-REQ-023173/B-SID-77-Destination_Info_St (TcSE ROIN-160691-3)

Data size: up to 49/29 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier
0x77: Destination_Info_St

Byte 1: Utilization
0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 48/28 (Coding Table I / Coding Table II):

Byte 1:

Bits 0-3: Reserved
Bits 4-7: DistUnits
0x0 Miles
0x1 Kilometres

Bytes 2-3: TotalDistTraveled
0x0
...
0xFFFF

Bytes 4-5: TotalTime : units=minutes
0x0 0 min
...
0xFFFF 65535 min

Byte 6: Destination
19 Characters Max plus 1 end of string character.

1.4.2.39 TP-LOG-TPL-REQ-023174/A-SID-79-MediaInformation_St (TcSE ROIN-160692-2)

Data size: up to 127/67 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x79: MediaInformation_St

Byte 1: Utilization

0x17: MP_Media7 – Generic Metadata

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 126/66 (Coding Table I / Coding Table II):

Byte 1:
Bits 0-2: Reserved

Bits 3 - 5: DataUpdate
0x0 Inactive
0x1 Set Operation
0x2 Data refresh

Bits 6 - 7: NonMetadataSrc
0x0 No
0x1 Yes

Byte 2: MetadataIcon_1
0x00 Invalid
0x01.. 0x18 IconID's

0x19 - 0xFF Reserved

Byte 3: MetadataIcon_2
0x00 Invalid
0x01.. 0x18 IconID's
0x19 - 0xFF Reserved

Byte 4:
Metatdata1
Metadata1
19 Characters Max plus 1 end of string character

Metadata2
Metadata2
19 Characters Max plus 1 end of string character

SourceInformation
SourceInformation
19 Characters Max plus 1 end of string character

1.4.2.40 TP-LOG-TPL-REQ-023175/A-SID-50-BTCallerIdentification_St (TcSE ROIN-160784-3)

Data size: up to 66/48 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0x50 : BTCallerIdentification

Byte 1: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 2: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3: BTDeviceIndex

Bit 0-3: Reserved

Bit 4 - 7: BTDevice_Index
0x0 – Reserved
0x1 – BT device index 1
...
0xF – BT device index 15

Byte 4: Status

Bit 0-1: Reserved

Bit 2-4: Phone Type
0x0 - No category
0x1 - Home
0x2 - Office
0x3 - Mobile
0x4 - Other
0x5 – Unknown

0x6 - Fax

Bit 5-7: Validity
0x0 – CLID Incoming call available
0x1 – CLID Second incoming call available
0x2 – CLID Outgoing call
0x3 - CLID Incoming SMS Available
0x4 - CLID Incoming Not available
0x5 - CLID Incoming SMS Not available

Byte 5 up to 65/47 (Coding Table I / Coding Table II):

CallID number Coding Table II fixed

Max. 25 characters, 24 characters plus 1 end of string character.

CallID Name

Max. 18 characters, 17 characters plus 1 end of string character.

1.4.2.41 TP-LOG-TPL-REQ-023176/A-SID-7A-TMCServiceProvider_St (TcSE ROIN-178778-3)

Data size: 9 byte

Byte 0: Signal identifier

0x7A: TMCServiceProvider_St

Byte 1: Utilization

0x73: Data_Service3 – TMC Data

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Country Code

Bit 0-3: Reserved
Bit 4-7: CC
0x00 – 0x0F: Country Code

Byte 5: Service Identifier

Bit 0-1: Reserved
Bit 2-7: SID
0x00 – 0x3F: Service Identifier

Byte 6: Location Table Number

Bit 0-1: Reserved
Bit 2-7: LTN
0x00 – 0x3F: Location Table Number

Byte 7: Encryption Information

Bit 0: Reserved
Bit 1-2: Test mode
0x0: Location code not encrypted
0x1: Location code encrypted
0x2: Reserved
0x3: Full encryption
Bit 3-7: ENCID
0x00 – 0x1F: Encryption Identifier

Byte 8: Location Table Number (before encryption)

Bit 0-1: Reserved
Bit 2-7: LTNBE
0x00 – 0x3F: Location Table Number before encryption

Test mode:
If Test mode is set to "0x00: Location code not encrypted" the terminal shall ignore the ENCID and instead use encryption parameters with values 0,0,0.

If Test mode is set to "0x01: Location code encrypted" the terminal shall ignore ENCID and instead use encryption parameters pre-advised by the service provider (Which of course must be 'pre-stored' within the terminal).

1.4.2.42 TP-LOG-TPL-REQ-023177/A-SID-7B-TMCGetServiceProvider_Rq (TcSE ROIN-180163-4)

Data size: 20 byte

Byte 0: Signal identifier

0x7B: TMCGetServiceProvider_Rq

Byte 1: Utilization

0x73: Data_Service3 – TMC Data

Byte 2: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3: CC

Bit 0-3: Reserved
Bit 4-7: CC
0x00 – 0x0F: Country Code

Byte 4-11: Preferred Service Provider

Byte 4:
Bit 7:
0x0 = SID 0x00 is not preferred

0x1 = SID 0x00 is preferred

Byte 4:

Bit 6:

0x0 = SID 0x01 is not preferred

0x1 = SID 0x01 is preferred

…

Byte 11:

Bit 0:

0x0 = SID 0x3F is not preferred

0x1 = SID 0x3F is preferred

Byte 12-19: Supported Location Table Number

Byte 12:

Bit 7:

0x0 = LTN 0x00 is not supported

0x1 = LTN 0x00 is supported

Byte 12:

Bit 6:

0x0 = LTN 0x01 is not supported

0x1 = LTN 0x01 is supported

…

Byte 19:

Bit 0:

0x0 = LTN 0x3F is not supported

0x1 = LTN 0x3F is supported

1.4.2.43 TP-LOG-TPL-REQ-023178/A-SID-4F-Initiate_BTCall_Rsp (TcSE ROIN-162221-2)

Data size: 2 byte

Byte 0: Signal identifier

0x4F : InitiateBTCall_Rsp

Byte 1: Command Execution Status

0x0y: Final Result	–	Success
0x1y: Final Result	–	Fail
0x2y: Final Result	–	Information
0x3y: Intermediate Result	–	Wait

Special response codes:	
No Service	-> CES 0x24 Final Result – Requested command not supported
Network Error	-> CES 0x26 Final Result – Connected Device not present
Number invalid	-> CES 0x27 Final Result – Feature not supported
Number busy	-> CES 0x28 Final Result – List full

1.4.2.44 TP-LOG-TPL-REQ-023179/A-SID-7C-MyKeyReportCardOutput_Rsp (TcSE ROIN-201379-1)

Data size: up to 43 bytes

Byte 0: Signal identifier

0x7C: MyKeyReportCardOutput_Rsp

Byte 1: Utilization

0x75: Data_Service5 - DataReport

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char

Byte 4: ReportInfo

Bit 0-3: reserved

Bit 4-7: ReportRequested

0x0 – Inactive
0x1 – January
0x2 – February
0x3 – March
0x4 – April
0x5 – May
0x6 – June
0x7 – July
0x8 – August
0x9 – September
0xA – October
0xB – November
0xC – December
0xD – Day
0xE – NotUsed
0xF – NotUsed

Byte 5: MaximumSpeed

0x00 – 0xFF (0- 255)

Bytes 6-7: FuelEconomy

0x0000 – 0x03E7 (0-999)

Note: Resolution of this signal is 0.1.

Examples : 0x000E = 1.4, 0x00FF = 25.5

Byte 8-9: DriveTime

0x0000 – 0xAE60 (0-44640 minutes)

Byte 10 up to 23: BuckledPercentage

Array(1 - 7) of record (MonitoredSeat, BuckledPercentage)

Record definition (2 bytes):

Byte 0 : MonitoredSeat
0x00 – DriverSeat
0x01 – PassengerSeat
0x02 – 0x06 reserved

Byte 1 : Buckledpercentage
0x00 – 0x64: Percentage

Byte 24 up to 27: SyncUsage

Array(1 - 2) of record (SyncFeature, UsagePercentage)

Record definition (2 bytes):

Byte 0 : SyncFeature
0x00 – PhoneConnectedNotActive
0x01 – PhoneConnectedActive

Byte 1 : UsagePercentage
0x00 – 0x64: Percentage

Byte 28: NbrOfSpeedIntervals

Value: 1 up to 7

Byte 29 up to 42: SpeedInterval

Array(1 – NbrOfSpeedIntervals) of record (SpeedInterval, SpeedIntervalPercentage)

Record definition (2 bytes):

Byte 0 : SpeedInterval
Value: 0x00 – 0xFF

Byte 1 : SpeedIntervalPercentage
0x00 – 0x64: Percentage

1.4.2.45 TP-LOG-TPL-REQ-023180/A-SID-81-CabinComfortPreferenceList_Rsp (TcSE ROIN-223467-1)

Data size: up to 447/237 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x81: CabinComfortPreferenceList_Rsp

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: The maximum number of cabin comfort preferences that can be returned is limited to 10.*

Byte 5: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 6: ItemsInList

0x00: Reserved
0x01: Items Available 1
0x02: Items Available 2
....
0xFE: Items Available 254
0xFF: No Entry

Byte 7 up to 446/236 (Coding Table I/Coding Table II): List Info

Array(1..NumberOfItems) of record (ItemIndex, CabinComfortPrefIDNumber, CabinComfortPreferenceName)

Record definition (up to 440/230 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex
0x00: Reserved
0x01: Index1
...
0xFF: Index255

Byte 1: CabinComfortPrefIDNumber:
0x00: Null
0x01: Cabin Comfort ID1
0x02: Cabin Comfort ID2
…
0x0A: Cabin Comfort ID10
0x0B: Reserved
...
0xFF: Reserved

Byte 2 up to Byte 43/22 (Coding Table I/Coding Table II)

CabinComfortPreferenceName

Max. 20 characters plus 1 End Of String

1.4.2.46 TP-LOG-TPL-REQ-023181/B-SID-82-ChargeProfileList_Rq (TcSE ROIN-223468-1)

Data size: up to 37 (Coding Table III) bytes

Byte 0: Signal identifier

0x82: ChargeProfileList_Rq

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x00: INVALID/INACTIVE

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x2: Coding Table III
0x00-0xFF Hexadecimal Notation

Byte 4: OpCode

0x00: Reserved
0x01: Read
0x02: Modify
0x03: Reserved
…
0xFE: Reserved
0xFF: No Entry

Byte 5: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: The Maximum number of charge locations that can be returned is limited to 10.*

If RspCode = MODIFY, then NumberOfItems = 0x01

Byte 6: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: If RspCode = MODIFY, then StartIndex = 0x01*

Byte 7 up to 36 (Coding Table III): List Info

Array(1..NumberOfItems) of record (ItemIndex, ChargeLocationIDNumber, ChargeLocationName)

Record definition (up to 30 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex

0x00: Reserved
0x01: Index1
...
0xFF: Index255

Byte 1: ChargeProfileIDNumber:
0x00: Unknown/Any Location
0x01: Location 1
0x02: Location 2
…
0x09: Location 9
0x0A: Reserved
...
0xFF: Reserved

Byte 2: ChargeProfileChargePreference
0x00: Null
0x01: ChargeNow
0x02: ValueCharge
0x03: Reserved
…
0xFF: Reserved

Notes:
If OpCode = READ, Then
Byte 7 = 0x00

If OpCode = MODIFY, Then
ItemIndex = ItemIndex
ChargeProfileIDNumber = ChargeProfileIDNumber
ChargeProfileChargePreference = ChargeProfileChargePreference

1.4.2.47 TP-LOG-TPL-REQ-023182/A-SID-83-ChargeProfileList_Rsp (TcSE ROIN-223469-2)

Data size: up to 458/248 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier

0x83: ChargeProfileList_Rsp

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RspCode

0x00: Reserved

0x01: List Info
0x02: Modified
0x03: Reserved
…
0xFE: Reserved
0xFF: No Entry

Byte 5: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: The Maximum number of charge locations that can be returned is limited to 10*

If RspCode = Modified, then NumberOfItems = 0xFF

Byte 6: StartIndex

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

***Note**: If RspCode = Modified, then StartIndex = 0xFF*

Byte 7: ItemsInList

0x00: Reserved
0x01: Items Available 1
0x02: Items Available 2
....
0xFE: Items Available 254
0xFF: No Entry

***Note**: If RspCode = Modified, then itemsInList = 0xFF*

Byte 8 up to 457/247 (Coding Table I/Coding Table II): List Info

Array(1..NumberOfItems) of record (ItemIndex, ChargeLocationIDNumber, ChargeLocationName)

Record definition (up to 450/240 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex
0x00: Reserved
0x01: Index1
...
0xFF: Index255

Byte 1: ChargeProfileIDNumber:
0x00: Unknown/Any Location
0x01: Location 1
0x02: Location 2
…
0x09: Location 9
0x0A: Reserved

...
0xFF: Reserved

Byte 2: ChargeProfileChargePreference
0x00: Null
0x01: ChargeNow
0x02: ValueCharge
0x03: Reserved
…
0xFF: Reserved

Byte 3 up to Byte 44/23 (Coding Table I/Coding Table II)

ChargeLocationName
Max. 20 characters plus 1 End Of String

Notes:
If RspCode = List Info, Then
ItemIndex = ItemIndex
ChargeProfileIDNumber = ChargeProfileIDNumber
ChargeProfileChargePreference = ChargeProfileChargePreference

If RspCode = Modified, Then
Byte 8 = 0x00

1.4.2.48 TP-LOG-TPL-REQ-023183/A-SID-84-ChargeSchedule_Rq (TcSE ROIN-223470-2)

Data size: up to 56 (Coding Table III) bytes

Byte 0: Signal identifier
0x84: ChargeSchedule_Rq

Byte 1: Utilization
0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status
0x00: INVALID/INACTIVE

Byte 3: Character Coding
Bit 0-5: reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF Hexadecimal Notation

Byte 4: OpCode
0x00: Reserved
0x01: Read
0x02: Modify
0x03: Reserved
…
0xFE: Reserved
0xFF: No Entry

Byte 5: ScheduleType
0x00: Weekly
0x01: Daily
0x02: Weekday/Weekend
0x03: Reserved
…

0xFF: Reserved

Byte 6: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Note: *The number of items requested is defined by the schedule type as follows:*

ScheduleType = Weekly, NumberOfItems = 7

ScheduleType = Dailly, NumberOfItems = 1

ScheduleType = Weekday/Weekend, NumberOfItems = 2

Byte 7 up to 55 (Coding Table III): Charge Schedule Info

Array(1..NumberOfItems) of record (BinNumber, ReadyToGo1_TimeHr, ReadyToGo1_TimeMin, ReadyToGo1_CabinComfPrefID, ReadyToGo2_TimeHr, ReadyToGo2_TimeMin, ReadyToGo2_CabinComfPrefID)

*Record definition (up to 49 (*Coding Table III*) bytes):*
Byte 0: BinNumber:
0x00: Null
0x01: Bin 1
0x02: Bin 2
…
0x0A: Bin 10
0x0B: Reserved
...
0xFF: Reserved

Byte 1: ReadyToGo1_TimeHr:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x17: ~~24~~ 23
0x18: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *Times are always encoded in 24 hour notation.*

Byte 2: ReadyToGo1_TimeMin:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x3B: 59
0x3C: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte 3: ReadyToGo1_CabinComfPrefID:

0x00: Reserved
0x01: Cabin Comfort ID1
0x02: Cabin Comfort ID 2
…
0x0A: Cabin Comfort ID10
0x0B: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte 4: ReadyToGo2_TimeHr:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x17: ~~24~~ 23
0x18: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *Times are always encoded in 24 hour notation*

Byte 5: ReadyToGo2_TimeMin:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x3B: 59
0x3C: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte 6: ReadyToGo2_CabinComfPrefID:
0x00: Reserved
0x01: Cabin Comfort ID1
0x02: Cabin Comfort ID 2
…
0x0A: Cabin Comfort ID10
0x0B: Reserved
…
0xFE: Reserved
0xFF: Invalid

Notes:
If OpCode = READ, Then
Byte 7 = 0x00

If OpCode = MODIFY, Then
ItemIndex = ItemIndex
BinNumber = BinNumber
ReadyToGo1_TimeHr = ReadyToGo1_TimeHr
ReadyToGo1_TimeMin = ReadyToGo1_TimeMin
ReadyToGo1_CabinComfPrefID = ReadyToGo1_CabinComfPrefID
ReadyToGo2_TimeHr = ReadyToGo2_TimeHr
ReadyToGo2_TimeMin = ReadyToGo2_TimeMin
ReadyToGo2_CabinComfPrefID = ReadyToGo2_CabinComfPrefID

1.4.2.49 TP-LOG-TPL-REQ-023184/A-SID-85-ChargeSchedule_Rsp (TcSE ROIN-223471-2)

Data size: up to 85 (Coding Table III) bytes

Byte 0: Signal identifier

0x85: ChargeSchedule_Rsp

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF Hexadecimal Notation

Byte 4: RspCode

0x00: Reserved
0x01: List Info
0x02: Modified
0x03: Reserved
…
0xFE: Reserved
0xFF: No Entry

Byte 5: ScheduleType

0x00: Weekly
0x01: Daily
0x02: Weekday/Weekend
0x03: Reserved
…
0xFF: Reserved

Byte 6: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Note: *The number of items returned is defined by the schedule type as follows:*

ScheduleType = Weekly, NumberOfItems = 7

ScheduleType = Dailly, NumberOfItems = 1

ScheduleType = Weekday/Weekend, NumberOfItems = 2

If RspCode = Modified, then NumberOfItems = 0xFF

Byte 7: ActiveBin

0x00: Null

0x01: Bin1
0x02: Bin2
....
0x0A: Bin10
0x0B: Reserved
…
0xFF: Reserved

Note: *If ScheduleType = Daily or Weekday/Weekend, then ActiveBin = 0x00*

Byte 8 up to 84 (Coding Table III): Charge Schedule Info

Array(1..NumberOfItems) of record (ItemIndex, BinNumber, DateDay, DateMonth, DateYear, DayOfWeek, ReadyToGo1_TimeHr, ReadyToGo1_TimeMin, ReadyToGo1_CabinComfPrefID, ReadyToGo2_TimeHr, ReadyToGo2_TimeMin, ReadyToGo2_CabinComfPrefID)

*Record definition (up to 77 (*Coding Table III*) bytes):*
Byte 0: BinNumber:
0x00: Null
0x01: Bin 1
0x02: Bin 2
…
0x0A: Bin 10
0x0B: Reserved
...
0xFF: Reserved

Byte 1: DateDay:
0x00: Reserved
0x01: 1
0x02: 2
…
0x1F: 31
0x20: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *DateDay = FF when ScheduleType = Daily or Weekday/Weekend.*

Byte 2: DateMonth
0x00: Reserved
0x01: January
0x02: February
0x03: March
0x04: April
0x05: May
0x06: June
0x07: July
0x08: August
0x09: September
0x0A: October
0x0B: November
0x0C: December
0x0D: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *DateMonth = FF when ScheduleType = Daily or Weekday/Weekend.*

Byte 3: DateYear:

0x00: 2010
0x01: 2011
0x02: 2012
…
0x1E: 2040
0x1F: Invalid
0x20: Reserved
…
0xFF: Reserved

Note: *DateYear = FF when ScheduleType = Daily or Weekday/Weekend.*

Byte 4: DayOfWeek:

0x00: Reserved
0x01: Sunday
0x02: Monday
0x03: Tuesday
0x04: Wednesday
0x05: Thursday
0x06: Friday
0x07: Saturday
0x08: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *DayOfWeek = FF when ScheduleType = Daily or Weekday/Weekend.*

Byte 5: ReadyToGo1_TimeHr:

0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x17: ~~24~~ 23
0x18: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *Times are always encoded in 24 hour notation.*

Byte 6: ReadyToGo1_TimeMin:

0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x3B: 59
0x3C: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte 7: ReadyToGo1_CabinComfPrefID:

0x00: Reserved
0x01: Cabin Comfort ID1

0x02: Cabin Comfort ID 2
…
0x0A: Cabin Comfort ID10
0x0B: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte 8: ReadyToGo2_TimeHr:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x17: ~~24~~ 23
0x18: Reserved
…
0xFE: Reserved
0xFF: Invalid

Note: *Times are always encoded in 24 hour notation*

Byte 9: ReadyToGo2_TimeMin:
0x00: ~~Reserved~~ 0
0x01: 1
0x02: 2
…
0x3B: 59
0x3C: Reserved
…
0xFE: Reserved
0xFF: Invalid

Byte A: ReadyToGo2_CabinComfPrefID: :
0x00: Reserved
0x01: Cabin Comfort ID1
0x02: Cabin Comfort ID 2
…
0x0A: Cabin Comfort ID10
0x0B: Reserved
…
0xFE: Reserved
0xFF: Invalid

Notes:
If RspCode = List Info, Then
ItemIndex = ItemIndex
BinNumber = BinNumber
DateDay = DateDay
DateMonth = DateMonth
DateYear = DateYear
DayOfWeek = DayOfWeek
ReadyToGo1_TimeHr = ReadyToGo1_TimeHr
ReadyToGo1_TimeMin = ReadyToGo1_TimeMin
ReadyToGo1_CabinComfPrefID = ReadyToGo1_CabinComfPrefID
ReadyToGo2_TimeHr = ReadyToGo2_TimeHr
ReadyToGo2_TimeMin = ReadyToGo2_TimeMin
ReadyToGo2_CabinComfPrefID = ReadyToGo2_CabinComfPrefID

If RspCode = Modified, Then Byte 8 = 0x00

1.4.2.50 TP-LOG-TPL-REQ-023185/A-SID-7D-SDARS_PID_St (TcSE ROIN-203200-1)

Data size: up to 14 (Coding Table II) bytes

Byte 0: Signal identifier

0x7D: SDARS_PID_St

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Response Code

0x0: Reserved
0x1: New PID
0x2: Clear PID
0x3 - 0xFF: Reserved

Byte 5 up to 13 (Coding Table II):

PID
Fixed 8 characters

Channel Number
Fixed 1 Byte
0x00…0xFF

Note: *If RspCode = Clear PID, Then* *PID = 0x00* *Channel Number = Channel Number*

1.4.2.51 TP-LOG-TPL-REQ-023186/A-SID-86-SyncSoftwareVersion_Rsp (TcSE ROIN-229666-1)

Data size: up to 46/25 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x86: SyncSoftwareVersion_Rsp

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 45/24 (Coding Table I / Coding Table II):

Software Version
Max. 21 characters, 20 characters plus 1 end of string character.

1.4.2.52 TP-LOG-TPL-REQ-023187/A-SID-87-TelServESN_St (TcSE ROIN-229665-1)

Data size: up to 30/17 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x87: TelServESN_St

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 29/16 (Coding Table I / Coding Table II):

ESN
Max. 13 characters, 12 characters plus 1 end of string character.

1.4.2.53 TP-LOG-TPL-REQ-023188/A-SID-88-TelServUserID_St (TcSE ROIN-229667-1)

Data size: up to 130/67 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x88: TelServUserID_St

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 129/66 (Coding Table I / Coding Table II):

Old User
Max. 21 characters, 20 characters plus 1 end of string character.

New User
Max. 21 characters, 20 characters plus 1 end of string character.

Current User
Max. 21 characters, 20 characters plus 1 end of string character.

1.4.2.54 TP-LOG-TPL-REQ-023189/A-SID-89-ConsHistGraph_St (TcSE ROIN-266595-1)

Data size: up to 35 bytes.

Byte 0: Signal identifier

0x89: ConsHistGraph_St

Byte 1: Utilization

0x82: Electrification Information

Byte 2: Command Execution Status

0x0y: Final Result - Success
0x1y: Final Result - Fail
0x2y: Final Result - Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF: Hexadecimal Notation

Byte 4: ConsHist1_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 5: ConsHistThr1_Pc_Dsply

0x00: 0
0x01: 1
…

0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 6: ConsHistColor1_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 7: ConsHist2_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 8: ConsHistThr2_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 9: ConsHistColor2_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 10: ConsHist3_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 11: ConsHistThr3_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 12: ConsHistColor3_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 13: ConsHist4_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 14: ConsHistThr4_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 15: ConsHistColor4_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 16: ConsHist5_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 17: ConsHistThr5_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 18: ConsHistColor5_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 19: ConsHist6_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 20: ConsHistThr6_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 21: ConsHistColor6_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 22: ConsHist7_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 23: ConsHistThr7_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 24: ConsHistColor7_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 25: ConsHist8_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available

0x7F: Faulty

Byte 26: ConsHistThr8_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 27: ConsHistColor8_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 28: ConsHist9_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 29: ConsHistThr9_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 30: ConsHistColor9_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 31: ConsHist10_Pc_Dsply

0x00: 0
0x01: 1
…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 32: ConsHistThr10_Pc_Dsply

0x00: 0
0x01: 1

…
0x7D: 125
0x7E: Data_Not_Available
0x7F: Faulty

Byte 33: ConsHistColor10_D_Dsply

0x0: Color1
0x1: Color2
0x2: Grayed_Out

Byte 34: ConsHistTIPC_D_Dsply

0x0: Invalid
0x1: Display_1_Minute_Increments
0x2: Display_2_Minute_Increments
0x3: Display_6_Minute_Increments

Byte 35: ConsUnitIPC_D_Dsply

0x0: Invalid
0x1: Miles_Gallon_US
0x2: Liters_100_km
0x3: km_L
0x4: miles_gallon_UK
0x5: Whr_mi
0x6: Whr_km
0x7: Miles_Gallon
0x8: Liters_100_km_equivalent
0x9: km_L_equivalent
0xA: miles_gallon_UK_equivalent
0xB: Reserved_11
0xC: Reserved_12
0xD: Reserved_13
0xE: Reserved_14
0xF: Reserved_15

1.4.2.55 TP-LOGv2-TPL-REQ-013859/A-SID-22-NavigationSymbolInfo_St (TcSE ROIN-281274)

Data size up to 46 bytes

Byte 0: Signal identifier

0x22: NavigationSymbolInfo_St

Byte 1: HeaderInfo

Bit 0–4: reserved

Bit 5-6: UnitOfLength

0x0 – kilometres
0x1 – miles
0x2 – metres
0x3 – yards

Bit 7: PropertyOfDistance

0x0 – bargraph
0x1 – length

NOTE:
The values 0x2 and 0x3 of the UnitOfLength shall only be used for Gen3 systems

Byte 2 -3: DistanceToNextManeuver

Values: 0x0 up to 0xFFFF

NOTE:
If the "PropertyOfDistance" is set to "length" the "DistanceToNextManeuver" will be in steps 0.1 kilometres / miles.

If the "Property of distance" is set to "bargraph" the "DistanceToNextmaneuver" will be in steps 0.01 kilometres / miles.

If the "UnitOfLength" is set metres or yards the "DistanceToNextManeuver" will be in steps of 5.

Byte 4: BargraphSteps

Values: 0x00 up to 0xFF

NOTE:
The relative size of bargraph (0% – 100% = 0x00 – 0xFF). The BargraphSteps value decreases from 0xFF at start down to 0x00 when the decision point is reached.

Byte 5: NumberOfStreetSegments

Value: 0x1 up to 0x14

Byte 6 - 45: StreetSegments

Array(1.. NumberOfStreetSegments) of record (DirectionAndNumber, ManeuverElement)

Bit 0-7: DirectionAndNumber

0x00 – North
0x01 – 1
0x02 – 2
0x03 – 3
0x04 – 4
0x05 – 5
0x06 – 6
0x07 – 7
0x08 – 8
0x09 – 9
0x10 – North – North – West
0x20 – North – West
0x30 – West – North – West

0x40 – West
0x50 – West – South – West
0x60 – South – West
0x70 – South – South – West
0x80 – South
0x90 – South – South – East
0xA0 – South – East
0xB0 – East – South – East
0xC0 – East
0xD0 – East – North – East
0xE0 – North – East
0xF0 – North – North – East
0xFF – No direction

Bit 8-15: ManeuverElement

0x00 – NoSymbol (NO_SYMBOL)
0x01 – SideStreet ((SIDESTREET)
0x02 – Silent (SILENT)
0x03 – Turn (TURN)
0x04 – UTurnTrafficRightSide (U_TURN_TRS_RIGHT)
0x05 – UTurnTrafficLeftSide (U_TURN_TRS_LEFT)
0x06 – ChangeLane (FILTER)
0x07 – ServiceRoad (PARALLEL_CWY)
0x08 – ServiceRoad (SERVICE ROAD)
0x09 – Fork (ORIENTATE)
0x0A – Exit (EXIT)
0x0B – TurnOnMainroad (MAINROAD)
0x0C – RoundaboutTrafficRightSide (ROUNDABOUT_TRS_RIGHT)
0x0D – RoundaboutTrafficLeftSide (ROUNDABOUT_TRS_LEFT)
0x0E – SquareTrafficRightSide (SQUARE_TRS_RIGHT)
0x0F – SquareTrafficLeftSide (SQUARE_TRS_LEFT)
0x10 – NoInfo (NO_INFO)
0x11 – FollowStreet (FOLLOW_STREET)
0x12 – ChangeLane (PREPARE_TURN)
0x13 – ArrivedAtDestination (DEST_REACHED)
0x14 - ArrivedAtWaypoint
0x15 - ApproachingDestination
0x16 - ApproachingWaypoint
0x17 - EnterHighway
0x18 - FerryAhead
0x19 - Merge
0x20 – OffRoad (OFF_ROAD)
0x21 – OffMap (OFF_MAP)
0x22 – NoRoute (NO_ROUTE)
0x23 – CalcRoute (CALC_ROUTE)
0x24 – ArrivedDestinationOffMap (DEST_AREA)
0x25 – RecalcRoute (RECALC_ROUTE)
0x30 – Number (NUMBER)

1.4.2.56 TP-LOG-TPL-REQ-023190/A-SID-22-NavigationSymbolInfo_St (TcSE ROIN-138046-7)

Data size up to 46 bytes

Byte 0: Signal identifier

0x22: NavigationSymbolInfo_St

Byte 1: HeaderInfo

Bit 0–4: reserved

Bit 5-6: UnitOfLength

0x0 – kilometres
0x1 – miles
0x2 – metres
0x3 – yards

Bit 7: PropertyOfDistance

0x0 – bargraph
0x1 – length

NOTE:
The values 0x2 and 0x3 of the UnitOfLength shall only be used for Gen3 systems

Byte 2 -3: DistanceToNextManeuver

Values: 0x0 up to 0xFFFF

NOTE:
If the "PropertyOfDistance" is set to "length" the "DistanceToNextManeuver" will be in steps 0.1 kilometres / miles.

If the "Property of distance" is set to "bargraph" the "DistanceToNextmaneuver" will be in steps 0.01 kilometres / miles.

If the "UnitOfLength" is set metres or yards the "DistanceToNextManeuver" will be in steps of 5.

DistanceToNextManeuver shall be sent in INTEL format. For example, if DistanceToNextManuever is 1.2 Miles and PropertyOfDistance = length, Byte 2 = 0C and byte 3 = 00

Byte 4: BargraphSteps

Values: 0x00 up to 0xFF

NOTE:
The relative size of bargraph (0% – 100% = 0x00 – 0xFF). The BargraphSteps value decreases from 0xFF at start down to 0x00 when the decision point is reached.

Byte 5: NumberOfStreetSegments

Value: 0x1 up to 0x14

Byte 6 - 45: StreetSegments

Array(1.. NumberOfStreetSegments) of record (DirectionAndNumber, ManeuverElement)

Bit 0-7: DirectionAndNumber

0x00 – North
0x01 – 1
0x02 – 2
0x03 – 3
0x04 – 4
0x05 – 5
0x06 – 6
0x07 – 7
0x08 – 8
0x09 – 9
0x10 – North – North – West

0x20 – North – West
0x30 – West – North – West
0x40 – West
0x50 – West – South – West
0x60 – South – West
0x70 – South – South – West
0x80 – South
0x90 – South – South – East
0xA0 – South – East
0xB0 – East – South – East
0xC0 – East
0xD0 – East – North – East
0xE0 – North – East
0xF0 – North – North – East
0xFF – No direction

Bit 8-15: ManeuverElement

0x00 – NoSymbol (NO_SYMBOL)
0x01 – SideStreet ((SIDESTREET)
0x02 – Silent (SILENT)
0x03 – Turn (TURN)
0x04 – UTurnTrafficRightSide (U_TURN_TRS_RIGHT)
0x05 – UTurnTrafficLeftSide (U_TURN_TRS_LEFT)
0x06 – ChangeLane (FILTER)
0x07 – ServiceRoad (PARALLEL_CWY)
0x08 – ServiceRoad (SERVICE ROAD)
0x09 – Fork (ORIENTATE)
0x0A – Exit (EXIT)
0x0B – TurnOnMainroad (MAINROAD)
0x0C – RoundaboutTrafficRightSide (ROUNDABOUT_TRS_RIGHT)
0x0D – RoundaboutTrafficLeftSide (ROUNDABOUT_TRS_LEFT)
0x0E – SquareTrafficRightSide (SQUARE_TRS_RIGHT)
0x0F – SquareTrafficLeftSide (SQUARE_TRS_LEFT)
0x10 – NoInfo (NO_INFO)
0x11 – FollowStreet (FOLLOW_STREET)
0x12 – ChangeLane (PREPARE_TURN)
0x13 – ArrivedAtDestination (DEST_REACHED)
0x14 - ArrivedAtWaypoint
0x15 - ApproachingDestination
0x16 - ApproachingWaypoint
0x17 - EnterHighway
0x18 - FerryAhead
0x19 - Merge
0x20 – OffRoad (OFF_ROAD)
0x21 – OffMap (OFF_MAP)
0x22 – NoRoute (NO_ROUTE)
0x23 – CalcRoute (CALC_ROUTE)
0x24 – ArrivedDestinationOffMap (DEST_AREA)
0x25 – RecalcRoute (RECALC_ROUTE)
0x30 – Number (NUMBER)

1.4.2.57 TP-LOG-TPL-REQ-023191/A-SID-8D-RadioText2_St (TcSE ROIN-296321-1)

Data size: up to 262/133 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0x8D: RadioText2_St

Byte 1: Utilization

0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) - RDS Latin shall be used.

Byte 4 up to 261 /132: (Coding Table I / Coding Table II): ItemName

Max. 129 characters, 128 characters plus 1 end of string character.

1.4.2.58 TP-LOG-TPL-REQ-048851/A-SID-90-EmergencyCallText_St (TcSE ROIN-305875-1)

Data size: up to 406/205 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x90: EmergencyCallText_St

Byte 1: Utilization

0x32: MobileCom_Service2 – Embedded Modem

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 405/204 (Coding Table I / Coding Table II):

EraGText
Max. 201 characters, 200 characters plus 1 end of string character.

1.4.2.59 TP-LOG-TPL-REQ-092298/A-SID-91-UpcomingStreetName_St

Data size: up to 66/37 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0x91: UpcomingStreetName_St

Byte 1: Utilization
0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Path Index
Bit 0-1: Reserved
Bit 2-7: Coding
0x0 - 7 = Reserved
0x8 - 63 = IndexOfPath

Byte 5: Stub Path Index
Bit 0-1: Reserved
Bit 2-7: Coding
0x0 = StubStartsFirstPathInTheHorizon
0x1 - 7 = Reserved
0x8 - 63 = SubIndexOfPath

Byte 6: Road Shield Icon:
Bit 0-7: Coding

Byte 7 up to 24/15 (Coding Table I / Coding Table II): Road Shield Text:
Byte 1 up to 18/9 (Coding Table I / Coding Table II): RoadShieldText
9 characters, 8 letters plus 1 end of string character

Byte 25/16 up to 65/36 (Coding Table I / Coding Table II): Upcoming Street Name:
Byte 1 up to 40/20 (Coding Table I / Coding Table II): UpcomingStreetName
20 characters, 19 letters plus 1 end of string character

1.4.2.60 TP-LOG-TPL-REQ-023249/B-SID-92-DynamicLabelPlus_St (TcSE ROIN-286211)

Data size: up to 520/391 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier
0x92: DynamicLabelPlus_St

Byte 1: Utilization
0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) (RDS Latin used instead)

Byte 4: ItemInfo

Bit 0-5: Reserved
Bit 6-7: CommandTypeCode
0x0: New
0x1: Update
0x2: Delete
0x3: Reserved

Byte 5: NbrOfTypes

Bit 0: Reserved
Bit 1-7: NbrOfTypes
0x00: NoTagsAvailable
0x01 up to 0x40

Byte 6 up to 263/134 (Coding Table I / Coding Table II): RadioText

Max. 129 characters, 128 letters plus 1 end of string character

Byte 264/135 up to 519/390 (Coding Table I / Coding Table II): ItemVector

Array (1.. NbrOfTypes) of Record (ContentTypeID, ContentType, StartMarker, LengthMarker)
Record definition (4 bytes):

Byte 1: ContentTypeID
0x01 up to 0x40

Byte 2: ContentType
0x01 up to 0x40

Byte 3: StartMarker
0x01 up to 0x80

Byte 4: LengthMarker
0x01 up to 0x80

1.4.2.61 TP-LOG-TPL-REQ-134551/A-SID-93-JournalineTxtMsg_St

Data size: up to 4095 (Fixed Coding Table II) byte

Byte 0: Signal identifier

0x93: JournalineTxtMsg_St

Byte 1: Utilization

0x03: Radio_Service3 – DAB

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char) (RDS Latin used instead)

Byte 4 up to 4094 (Fixed Coding Table II): Text Message:

Max. 4091 characters, 4090 letters plus 1 end of string character

1.4.2.62 TP-LOG-TPL-REQ-166128/B-SID-94-WifiInfo_Rq

Data Size: up to 201/103 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier
0x94: WifiInfo_Rq

Byte 1: Utilization
0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status
0x00: INVALID/INACTIVE

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCode
0x00: Reserved
0x01: Read
0x02: WriteSSID
0x03: WritePassword
0x04 - 0xFF: Reserved

Byte 5 up to 200/102 (Coding Table I / Coding Table II):
Password
Max. 65 characters, 64 plus 1 end of string
SSID
Max. 33 characters, 32 plus 1 end of string

Note:
When OpCode = 0x01 Read, Password and SSID will be end of string (0x00)
When OpCode = 0x02 WriteSSID, Password will be end of string (0x00)
When OpCode = 0x03: WritePassword, SSID will be end of string (0x00)

1.4.2.63 TP-LOG-TPL-REQ-166129/B-SID-95-WifiInfo_Rsp

Data Size: up to 201/103 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier
0x95: WifiInfo_Rsp

Byte 1: Utilization

0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCode
0x00: Reserved
0x01: Data
0x02: SSIDWritten
0x03: PasswordWritten
0x04 - 0xFF: Reserved

Byte 5 up to 200/102 (Coding Table I / Coding Table II):
Password
Max. 65 characters, 64 plus 1 end of string
SSID
Max. 33 characters, 32 plus 1 end of string

Note:
When OpCode = 0x01 Data, Password and SSID will both be sent
When OpCode = 0x02 SSIDWritten or 0x03 PasswordWritten, Password and SSID will both be end of string (0x00)

1.4.2.64 TP-LOG-TPL-REQ-166130/C-SID-96-CarrierInfo_Rsp

Data Size: up to 876/440 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier
0x96: CarrierInfo_Rsp

Byte 1: Utilization
0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 875/439 (Coding Table I / Coding Table II):

Ford Landing URL
Max. 193 characters, 192 plus 1 end of string
Lincoln Landing URL
Max. 193 characters, 192 plus 1 end of string
Ford Phone Number
Max. 25 characters, 24 plus 1 end of string
Lincoln Phone Number
Max. 25 characters, 24 plus 1 end of string

1.4.2.65 TP-LOG-TPL-REQ-166131/F-SID-97-DataUsage_Rsp

Data Size: up to 128/77 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier
0x97: DataUsage_Rsp

Byte 1: Utilization
0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Counter Hour
0x00: Hour 0
…
0x17: Hour 23
0x18 - 0xFE: Reserved
0xFF: Invalid

Byte 5: Counter Minute
0x00: Minute 0
…
0x3B: Minute 59
0x3C - 0xFE: Reserved
0xFF: Invalid

Byte 6: Counter Second
0x00: Second 0
…
0x3B: Second 59
0x3C - 0xFE: Reserved
0xFF: Invalid

Byte 7: Plan Type

0x00: Invalid
0x01: Shared
0x02: Session

Byte 8: Expiry/Renewal Date

0x00: Invalid
0x01: Expiry Date
0x02: Renewal Date

Byte 9: Expiry/Renewal Month

0x00: Invalid
0x01: January
0x02: February
0x03: March
0x04: April
0x05: May
0x06: June
0x07: July
0x08: August
0x09: September
0x0A: October
0x0B: November
0x0C: December
0x0D - 0xFF: Reserved

Byte 10: Expiry/Renewal Day

0x00: Invalid
0x01: Day 1
…
0x1F: Day 31
0x20 - 0xFF: Reserved

Byte 11: Expiry/Renewal Year

0x00: Year 2000
…
0xFE: Year 2254
0xFF: Invalid

Byte 12: Expiry/Renewal Hour

0x00: Hour 0
…
0x17: Hour 23
0x18 - 0xFE: Reserved
0xFF: Invalid

Byte 13: Expiry/Renewal Minute

0x00: Minute 0
…
0x3B: Minute 59
0x3C - 0xFE: Reserved
0xFF: Invalid

Byte 14: Expiry/Renewal Second

0x00: Second 0
…
0x3B: Second 59
0x3C - 0xFE: Reserved
0xFF: Invalid

Bytes 15-17: Data Used

0x000000: Data 0.00
…
0x01869F Data 999.99
0x0186A0 - 0xFFFFFE: Reserved
0xFFFFFF: Invalid

Note:
Data values are in steps of 0.01 decimal units (where the units used are outlined in Data Used Units)
Ex. 0x008707 = 34567 = 345.67 Mb (or Kb or Gb)

Byte 18: Data Used Units

0x0: Invalid
0x1: Kb
0x2: Mb
0x3: Gb

Bytes 19-21: Total Data

0x00000: Data 0.00
…
0x01869F Data 999.99
0x0186A0: Unlimited
0x0186A1 - 0xFFFFFE: Reserved
0xFFFFFF: Invalid

Note:
Data values are in steps of 0.01 decimal units (where the units used are outlined in Total Data Units)
Ex. 0x008707 = 34567 = 345.67 Mb (or Kb or Gb)

Byte 22: Total Data Units

0x0: Invalid
0x1: Kb
0x2: Mb
0x3: Gb

Note:
When Total Data Units = 0x0, no units shall be shown, no characters shall be displayed.

Byte 23: Data Used Percent

0x00: Data 0%
…
0x64: Data 100%
0x65 - 0xFE: Reserved
0xFF: Invalid

Byte 24: Overage Flag

0x0: Invalid
0x1: No
0x2: Yes

Byte 25: Data Plan Status
0x00: Invalid
0x01: Free Trial Period Waiting
0x02: Free Trial Period Active
0x03: No Active Subscription
0x04: Active Subscription

Byte 26 up to 127/76 (Coding Table I / Coding Table II):
User ID
Max. 51 characters, 50 plus 1 end of string

1.4.2.66 TP-LOG-TPL-REQ-166132/D-SID-98-DeviceList_Rsp

Data Size: up to 2332/1185 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier
0x98: DeviceList_Rsp

Byte 1: Utilization
0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: List Type
0x00: Reserved
0x01: Connected List
0x02: BlockedList
0x03: Reserved
…
0x06: Reserved
0x07: No Entry

Byte 5: List Size
0x00: Inactive

0x01: List Size 1
…
0x1F: List Size 31
0xFF: No Entry

Note:
List Size maximum is 31

Byte 6: Total Number Of Devices Available
0x00: Inactive
0x01: 1 Device Available
…
0xFE: 254 Devices Available
0xFF: No Entry

Byte 7 up to 2331/1184 (Coding Table I/ Coding Table II): Vector
Array (1…N) of record (IndexNumber, DeviceName, MAC) with
TotalNumberOfDevices defined in ListSize

Record definition (up to 2325/1178 (Coding Table I/Coding Table II) bytes):
Byte 0: ItemIndex
0x00 Inactive
0x01 Index 1
…
0xFF Index 255

Byte 1 up to 74/37 (Coding Table I/Coding Table II):
MAC
Fixed 17 characters

Device Name
Max. 20 characters, 19 plus 1 end of string

Note:
If there are no devices in the list, List Size and Total Number Of Devices Available = 0xFF: No Entry
The Vector Array shall not be transmitted

1.4.2.67 TP-LOG-TPL-REQ-194071/A-SID-99-TrafficServiceProvider_St

Data size: 8 byte

Byte 0: Signal identifier
0x99: TrafficServiceProvider_St

Byte 1: Utilization
0x73: Data_Service3 – TPEG Data

Byte 2: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 3: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 4-6: tuned SID

0x000000: No SID tuned
0x000001 – 0xFFFFFF: SID

Byte 7: Service Status

Bit 0-4: Reserved
Bit 5 PreferredSIDStatus:
0x0: Preferred SID not available
0x1: Preferred SID available
Bit 6 SupportedSIDStatus:
0x0: Supported SID not available
0x1: Supported SID available
Bit 7 SIDTableEmpty
0x0 inactive
0x1 active

1.4.2.68 TP-LOG-TPL-REQ-194072/A-SID-9A-TrafficGetServiceProvider_Rq

Data size: up to 197 byte

Byte 0: Signal identifier

0x9A: TrafficGetServiceProvider_Rq

Byte 1: Utilization

0x73: Data_Service3 – TPEG Data

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 3: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 4-6: preferred SIDs

preferredSID:
0x000000 – 0xFFFFFF

Byte 7: NbrOfSupportedSIDs

Value: 1 up to 63

Byte 8 up to 196: ItemVector

Array (1.. NbrOfSupported SIDs) of Record (SupportedSID)
Record definition (up to 189 bytes):

Byte 0-2: SID

SID:
0x000000 - 0xFFFFFF

1.4.2.69 TP-LOG-TPL-REQ-195173/A-SID-9B-WifiHotspotMAC_Rsp

Data Size: up to 40/22 (Coding Table I / Coding Table II) bytes

Byte 0: Signal Identifier

0x9B: WifiHotspotMAC_Rsp

Byte 1: Utilization

0x32: MobileCom_Service2 - Embedded Modem

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 39/21 (Coding Table I / Coding Table II):

MAC
Max. 18 characters, 17 plus 1 end of string

1.4.2.70 TP-LOG-TPL-REQ-207875/A-SID-A1-SDARS_ChannelList_Rsp

Data size: up to 1057 (Coding Table II) bytes

Byte 0: Signal identifier

0xA1: SDARS_ChannelList_Rsp

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: RspCode

Bit 0-7:RspCode

0x0: Reserved
0x1: List Info
...
0x2..0xFF: Reserved

Byte 5 - 6: NumberOfItemsTransmitted

0x00: Invalid
0x01: 1
0x02: 2
....
0x1E: 30
0x1F – 0xFF: Reserved

Byte 7 up to 1056 (Coding Table II): Channel List

Array(1..NumberOfItems) of record (ItemIndex, Channel Number, SID, Short Channel Name, Long Channel Name)

Record definition (up to 35 (Coding Table II) bytes):
Byte 0: ItemIndex
0x00: Invalid
0x01: 1
0x02: 2
....
0x1E: 30
0x1F – 0xFF: Reserved

Byte 1-2: Channel Number
0x0000: 0
0x0001: 1
....
0x03E7: 999
0x3E8 – 0xFFFF: Reserved

Byte 3-4: SID
0x0000: 0
0x0001: 1
....
0x03E7: 999
0x3E8 – 0xFFFF: Reserved

Byte 5 up to 34 (Coding Table II)

Short Channel Name
Max. 8 characters plus 1 End Of String

Long Channel Name
Max. 20 characters plus 1 End Of String

Note: *Both Long and Short channel names will be sent. The HMI will decide which to display.*

1.4.2.71 TP-LOG-TPL-REQ-208270/A-SID-A2-SDARS_ChannelList_Rq

Data size: up to 96 (Coding Table III) bytes

Byte 0: Signal identifier

0xA2: SDARS_ChannelList_Rq

Byte 1: Utilization

0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status

0x00: Invalid/Inactive

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x2: Coding Table III
0x0000-0xFFFF Hexidecimal Notation

Byte 4: OpCode

Bit 0-7:RspCode

0x0: Reserved
0x1: Read
...
0x2..0xFF: Reserved

Byte 5: NumberOfItemsRequested

0x00: Invalid
0x01: 1
0x02: 2
....
0x1E: 30
0x1F - 0xFF: Reserved

Byte 6 up to 95 (Coding Table III): Channel List Request

Array(1..NumberOfItems) of record (ItemIndex, SID)

Record definition (up to 3 (Coding Table III) bytes):
Byte 0: ItemIndex

0x00: Invalid
0x01: 1
0x02: 2
....
0x1E: 30
0x1F - 0xFF: Reserved

Byte 1-2: SID

0x0000: 0
0x0001: 1
....
0x03E7: 999
0x3E8 – 0xFFFF: Reserved

1.4.2.72 TP-LOG-TPL-REQ-209648/B-SID-A3-MapVersionNumber_St

Data Size: up 160 bytes

Byte 0: Signal Identifier

0xA3: MapVersionNumber_St

Byte 1: Utilization
0x22: Nav_Service2 - Navigation

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4: NbrOfLTNTables
0x00 Reserved
0x01 1 Item in LTNVersionNumberItemVector
0x3C 60 Items in LTNVersionNumberItemVector

Byte 5 – Byte 7 up to Byte 182 – Byte 184 LTNVersionNumberItemVector
Array (1...60) of record (CountryCode, LTN, LTNMajorVersion, LTNMinorVersion)
Bit 0-3: CountryCode
Bit:4-9: LocationTableNumber
Bit:10-16: LTNMajorVersion
Bit:17-23: LTNMinorVersion

1.4.2.73 TP-LOG-TPL-REQ-214374/A-SID-A7-ActiveProjectionMode_St

Data size: up to 66/35 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0xA7: ActiveProjectionMode_St

Byte 1: Utilization

0x91: Projection_Mode

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Active Projection Mode

Bit 0-3:

0x0: No Projection Mode active
0x1: Other Projection Mode active
0x2: Apple CarPlay active
0x3: Android Auto active
0x4: Baido CarLife active
0x5: AppLink Mobile Navigation
0x6 – 0xF: Reserved

Bit 4-7: Reserved

Byte 5 up to 66/35 (Coding Table I / Coding Table II): Projection Mode Name

Max. 31 characters, 30 characters plus 1 end of string character

1.4.2.74 TP-LOG-TPL-REQ-214375/B-SID-A8-ProjMdeNavigationRepeater_St

Data size: 15 bytes.

Byte 0: Signal identifier

0xA8: ProjMdeNavigationRepeater_St

Byte 1: Utilization

0x91: Projection_Mode

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3-14: Navigation

Bit 0:

0x0: Navigation feature NOT available
0x1: Navigation feature available

Bit 1-2:

0x0: Inactive
0x1: Standard Navigation Interface utilization
0x2: Projection Mode Navigation Interface utilization
0x3: Reserved

Bit 3-4:

0x0: Inactive
0x1: List Server Navigation Info NOT available
0x2: List Server Navigation Info available
0x3: Reserved

Bit 5-6:

0x0: Inactive
0x1: CancelCurrentWaypoint.Rq() : CancelWaypoint NOT supported
0x2: CancelCurrentWaypoint.Rq() : CancelWaypoint supported
0x3: Reserved

Bit 7-8:

0x0: Inactive
0x1: CancelRoute.Rq() : CancelRoute NOT supported
0x2: CancelRoute.Rq() : CancelRoute supported
0x3: Reserved

Bit 9-10:

0x0: Inactive
0x1: Guidance_Repeat.Rq() : RepeatGuidance NOT supported
0x2: Guidance_Repeat.Rq() : RepeatGuidance supported
0x3: Reserved

Bit 11-12:

0x0: Inactive
0x1: CancelCurrentWaypoint.Rsp() : CancelWaypoint NOT supported
0x2: CancelCurrentWaypoint.Rsp() : CancelWaypoint supported
0x3: Reserved

Bit 13-14:

0x0: Inactive
0x1: CurrentStreetName.St() / CurrentStreetName2_St : DataUpdate NOT supported

0x2: CurrentStreetName.St() / CurrentStreetName2_St : DataUpdate supported
0x3: Reserved

Bit 15-16:

0x0: Inactive
0x1: CurrentStreetName.St() / CurrentStreetName2_St: CurentStreetName NOT supported
0x2: CurrentStreetName.St() / CurrentStreetName2_St: CurentStreetName supported
0x3: Reserved

Bit 17-18:

0x0: Inactive
0x1: CurrentStreetName.St() / CurrentStreetName2_St: SpeedLimit NOT supported
0x2: CurrentStreetName.St() / CurrentStreetName2_St : SpeedLimit supported
0x3: Reserved

Bit 19-20:

0x0: Inactive
0x1: Destination_Info.St() : TotalDistTraveled NOT supported
0x2: Destination_Info.St() : TotalDistTraveled supported
0x3: Reserved

Bit 21-22:

0x0: Inactive
0x1: Destination_Info.St() : DistUnits NOT supported
0x2: Destination_Info.St() : DistUnits supported
0x3: Reserved

Bit 23-24:

0x0: Inactive
0x1: Destination_Info.St() : TotalTime NOT supported
0x2: Destination_Info.St() : TotalTime supported
0x3: Reserved

Bit 25-26:

0x0: Inactive
0x1: Destination_Info.St() : Destination NOT supported
0x2: Destination_Info.St() : Destination supported
0x3: Reserved

Bit 27-28:

0x0: Inactive
0x1: DistanceToDestination.St() : Distance NOT supported
0x2: DistanceToDestination.St() : Distance supported
0x3: Reserved

Bit 29-30:

0x0: Inactive
0x1: DistanceToDestination.St() : Unit NOT supported
0x2: DistanceToDestination.St() : Unit supported
0x3: Reserved

Bit 31-32:

0x0: Inactive
0x1: GPS_Compass_direction.St() : Direction NOT supported
0x2: GPS_Compass_direction.St() . Direction supported
0x3: Reserved

Bit 33-34:

0x0: Inactive
0x1: NavError.St : ErrorStatus NOT supported
0x2: NavError.St : ErrorStatus supported

0x3: Reserved

Bit 35-36:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : HeaderInfo NOT supported
0x2: NavigationSymbolInfo.St() : HeaderInfo supported
0x3: Reserved

Bit 37-38:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : DistanceToNextManeuver NOT supported
0x2: NavigationSymbolInfo.St() : DistanceToNextManeuver supported
0x3: Reserved

Bit 39-40:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : BargraphSteps NOT supported
0x2: NavigationSymbolInfo.St() : BargraphSteps supported
0x3: Reserved

Bit 41-42:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : NumberOfStreetSegments NOT supported
0x2: NavigationSymbolInfo.St() : NumberOfStreetSegments supported
0x3: Reserved

Bit 43-44:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : DirectionAndNumbers NOT supported
0x2: NavigationSymbolInfo.St() : DirectionAndNumbers supported
0x3: Reserved

Bit 45-46:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : ManeuverElement NOT supported
0x2: NavigationSymbolInfo.St() : ManeuverElement supported
0x3: Reserved

Bit 47-48:

0x0: Inactive
0x1: NavigationSymbolInfo.St() : Array NOT supported
0x2: NavigationSymbolInfo.St() : Array supported
0x3: Reserved

Bit 49-50:

0x0: Inactive
0x1: RemainTimeToDestination.St() : Days NOT supported
0x2: RemainTimeToDestination.St() : Days supported
0x3: Reserved

Bit 51-52:

0x0: Inactive
0x1: RemainTimeToDestination.St() : Hours NOT supported
0x2: RemainTimeToDestination.St() : Hours supported
0x3: Reserved

Bit 53-54:

0x0: Inactive
0x1: RemainTimeToDestination.St() : Minutes NOT supported
0x2: RemainTimeToDestination.St() : Minutes supported
0x3: Reserved

Bit 55-56:

0x0: Inactive
0x1: RouteActive.St() : RouteActive NOT supported
0x2: RouteActive.St() : RouteActive supported
0x3: Reserved

Bit 57-58:

0x0: Inactive
0x1: StreetName.St() / StreetName2_St : Attribute NOT supported
0x2: StreetName.St() / StreetName2_St : Attribute supported
0x3: Reserved

Bit 59-60:

0x0: Inactive
0x1: StreetName.St() / StreetName2_St : StreetName NOT supported
0x2: StreetName.St() / StreetName2_St : StreetName supported
0x3: Reserved

Bit 61-62:

0x0: Inactive
0x1: WaypointsActive.St() : WaypointStatus NOT supported
0x2: WaypointsActive.St() : WaypointStatus supported
0x3: Reserved

Bit 63-64:

0x0: Inactive
0x1: UpcomingStreetName.St() / UpcomingStreetName2_St : Path Index NOT supported
0x2: UpcomingStreetName.St() / UpcomingStreetName2_St : Path Index supported
0x3: Reserved

Bit 65-66:

0x0: Inactive
0x1: UpcomingStreetName.St() / UpcomingStreetName2_St : Stub Path Index NOT supported
0x2: UpcomingStreetName.St() / UpcomingStreetName2_St : Stub Path Index supported
0x3: Reserved

Bit 67-68:

0x0: Inactive
0x1: UpcomingStreetName.St() / UpcomingStreetName2_St : Road Shield Icon NOT supported
0x2: UpcomingStreetName.St() / UpcomingStreetName2_St : Road Shield Icon supported
0x3: Reserved

Bit 69-70:

0x0: Inactive
0x1: UpcomingStreetName.St() / UpcomingStreetName2_St : RoadshieldText NOT supported
0x2: UpcomingStreetName.St() / UpcomingStreetName2_St : RoadshieldText supported
0x3: Reserved

Bit 71-72:

0x0: Inactive
0x1: UpcomingStreetName.St() / UpcomingStreetName2_St : UpcomingStreetNameText NOT supported
0x2: UpcomingStreetName.St() / UpcomingStreetName2_St : UpcomingStreetNameText supported
0x3: Reserved

Bit 73-95: Reserved

1.4.2.75 TP-LOG-TPL-REQ-214376/B-SID-A9-ProjMdeMediaPlayerRepeater_St

Data size: 8 bytes.

Byte 0: Signal identifier

0xA9: ProjMdeMediaPlayerRepeater_St

Byte 1: Utilization

0x91: Projection_Mode

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3-7: Media Player

Bit 0:

0x0: Media Player feature NOT available
0x1: Media Player feature available

Bit 1-2:

0x0: Inactive
0x1: Standard Media Player Interface utilization
0x2: Projection Mode Media Player Interface utilization
0x3: Reserved

Bit 3-4:

0x0: Inactive
0x1: List Server Generic Media NOT available
0x2: List Server Generic Media available
0x3: Reserved

Bit 5-6:

0x0: Inactive
0x1: ActiveTrackNum1.St() : TrackNumber NOT supported
0x2: ActiveTrackNum1.St() : TrackNumber supported
0x3: Reserved

Bit 7-8:

0x0: Inactive
0x1: NumberOfTracks.St() : NumberOfTracksSt NOT supported
0x2: NumberOfTracks.St() : NumberOfTracksSt supported
0x3: Reserved

Bit 9-10:

0x0: Inactive
0x1: TotalPlaytime.St() : TotalPlaytimeSt NOT supported
0x2: TotalPlaytime.St() : TotalPlaytimeSt supported
0x3: Reserved

Bit 11-12:

0x0: Inactive
0x1: TrackPlaytime.St() : TrackPlaytimeSt NOT supported
0x2: TrackPlaytime.St() : TrackPlaytimeSt supported
0x3: Reserved

Bit 13-14:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : DataUpdate NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : DataUpdate supported
0x3: Reserved

Bit 15-16:

0x0: Inactive

0x1: MediaInformation.St() / MediaInformation2_St : MetadataIcon_1 NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : MetadataIcon_1 supported
0x3: Reserved

Bit 17-18:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : MetadataIcon_2 NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : MetadataIcon_2 supported
0x3: Reserved

Bit 19-20:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : Metadata1 NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : Metadata1 supported
0x3: Reserved

Bit 21-22:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : Metadata2 NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : Metadata2 supported
0x3: Reserved

Bit 23-24:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : SourceInformation NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : SourceInformation supported
0x3: Reserved

Bit 25-26:

0x0: Inactive
0x1: MediaInformation.St() / MediaInformation2_St : NonMetadataSrc NOT supported
0x2: MediaInformation.St() / MediaInformation2_St : NonMetadataSrc supported
0x3: Reserved

Bit 27-39: Reserved

1.4.2.76 TP-LOG-TPL-REQ-214377/D-SID-AA-ProjMdePhoneRepeater_St

Data size: 12 bytes.

Byte 0: Signal identifier

0xAA: ProjMdePhoneRepeater_St

Byte 1: Utilization

0x91: Projection_Mode

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3-11: Phone

Bit 0:

0x0: Phone feature NOT available
0x1: Phone feature available

Bit 1-2:

0x0: Inactive
0x1: Standard Phone Interface utilization
0x2: Projection Mode Phone Interface utilization

0x3: Reserved

Bit 3-4:

0x0: Inactive
0x1: List Server Phone Info NOT available
0x2: List Server Phone Info available
0x3: Reserved

Bit 5-6:

0x0: Inactive
0x1: BTDefaultPhone.St() : DefPhone NOT supported
0x2: BTDefaultPhone.St() : DefPhone supported
0x3: Reserved

Bit 7-8:

0x0: Inactive
0x1: BTCallerIdentification.St() / BTCallerIdentification2_St : Phone Type NOT supported
0x2: BTCallerIdentification.St() / BTCallerIdentification2_St : Phone Type supported
0x3: Reserved

Bit 9-10:

0x0: Inactive
0x1: BTCallerIdentification.St() / BTCallerIdentification2_St : Validity NOT supported
0x2: BTCallerIdentification.St() / BTCallerIdentification2_St : Validity supported
0x3: Reserved

Bit 11-12:

0x0: Inactive
0x1: BTCallerIdentification.St() / BTCallerIdentification2_St : Index of Phone NOT supported
0x2: BTCallerIdentification.St() / BTCallerIdentification2_St : Index of Phone supported
0x3: Reserved

Bit 13-14:

0x0: Inactive
0x1: BTCallerIdentification.St() / BTCallerIdentification2_St : Caller number NOT supported
0x2: BTCallerIdentification.St() / BTCallerIdentification2_St : Caller number supported
0x3: Reserved

Bit 15-16:

0x0: Inactive
0x1: BTCallerIdentification.St() / BTCallerIdentification2_St : Caller name NOT supported
0x2: BTCallerIdentification.St() / BTCallerIdentification2_St : Caller name supported
0x3: Reserved

Bit 17-18:

0x0: Inactive
0x1: BTNetworkStatus.St() : Status NOT supported
0x2: BTNetworkStatus.St() : Status supported
0x3: Reserved

Bit 19-20:

0x0: Inactive
0x1: PhMicrophoneMute.St() : Mode NOT supported
0x2: PhMicrophoneMute.St() : Mode supported
0x3: Reserved

Bit 21-22:

0x0: Inactive
0x1: BluetoothStatus.St() : Status NOT supported
0x2: BluetoothStatus.St() : Status supported
0x3: Reserved

Bit 23-24:

0x0: Inactive
0x1: BTBatteryLevel.St() : Level NOT supported
0x2: BTBatteryLevel.St() : Level supported
0x3: Reserved

Bit 25-26:

0x0: Inactive
0x1: BTPhoneSts.St() : Status NOT supported
0x2: BTPhoneSts.St() : Status supported
0x3: Reserved

Bit 27-28:

0x0: Inactive
0x1: BTSignalStrength.St() : SignalStrength NOT supported
0x2: BTSignalStrength.St() : SignalStrength supported
0x3: Reserved

Bit 29-30:

0x0: Inactive
0x1: CallDuration.St() : Duration NOT supported
0x2: CallDuration.St() : Duration supported
0x3: Reserved

Bit 31-32:

0x0: Inactive
0x1: NewSMS.St() : SMS NOT supported
0x2: NewSMS.St() : SMS supported
0x3: Reserved

Bit 33-34:

0x0: Inactive
0x1: BTEndTelService.Rq() : SingleParam NOT supported
0x2: BTEndTelService.Rq() : SingleParam supported
0x3: Reserved

Bit 35-36:

0x0: Inactive
0x1: BTInCallOptions.Rq() : SingleParam NOT supported
0x2: BTInCallOptions.Rq() : SingleParam supported
0x3: Reserved

Bit 37-38:

0x0: Inactive
0x1: BTIncomingCall.Rq() : SingleParam NOT supported
0x2: BTIncomingCall.Rq() : SingleParam supported
0x3: Reserved

Bit 39-40:

0x0: Inactive
0x1: InitiateBTCall.Rq() : TypeOfCall NOT supported
0x2: InitiateBTCall.Rq() : TypeOfCall supported
0x3: Reserved

Bit 41-42:

0x0: Inactive
0x1: InitiateBTCall.Rq() : TelNbr NOT supported
0x2: InitiateBTCall.Rq() : TelNbr supported
0x3: Reserved

Bit 43-44:

0x0: Inactive
0x1: BTEndTelService.Rq() : SingleParam NOT supported
0x2: BTEndTelService.Rq() : SingleParam supported
0x3: Reserved

Bit 45-46:

0x0: Inactive
0x1: BTInCallOptions.Rq() : SingleParam NOT supported
0x2: BTInCallOptions.Rq() : SingleParam supported
0x3: Reserved

Bit 47-48:

0x0: Inactive
0x1: BTIncomingCall.Rq() : SingleParam NOT supported
0x2: BTIncomingCall.Rq() : SingleParam supported
0x3: Reserved

Bit 49-50:

0x0: Inactive
0x1: PhMicrophoneMute.Rq() : Mode NOT supported
0x2: PhMicrophoneMute.Rq() : Mode supported
0x3: Reserved

Bit 51-52:

0x0: Inactive
0x1: TextMessage.Rq() : Opcode NOT supported
0x2: TextMessage.Rq() : Opcode supported
0x3: Reserved

Bit 53-54

0x0: Inactive
0x1: GetBTPhoneName.Rq() : RequestStatus NOT supported
0x2: GetBTPhoneName.Rq() : RequestStatus supported
0x3: Reserved

Bit 55-56

0x0: Inactive
0x1: BTPhoneName.Rsp() : Phone Name NOT supported
0x2: BTPhoneName.Rsp() : Phone Name supported
0x3: Reserved

Bit 57-71: Reserved

1.4.2.77 TP-LOG-TPL-REQ-232513/A-SID-AC-StreetName2_St

Data size: up to 165/84 (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier
0xAC: StreetName2_St

Byte 1: Attribute
Bit 0-5: reserved

Bit 6 - 7: Text alignment

0x0 – centered
0x1 – left aligned
0x2 – right aligned

NOTE:
The text alignment bit can only be used for Gen2 systems

Byte 2: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3 up to 164/83 (Coding Table I / Coding Table II): StreetName2

Max. 81 characters, 80 characters plus 1 end of string character

1.4.2.78 TP-LOG-TPL-REQ-232514/A-SID-AD-CurrentStreetName2_St

Data size: up to 168/87 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0xAD: CurrentStreetName2_St

Byte 1: Utilization

0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 167/86 (Coding Table I / Coding Table II):

Byte 1:

Bits 0-3: Reserved

Bits 4 - 7: DataUpdate
0x0 Inactive
0x1 Set Operation
0x2 Data refresh

Byte 2: SpeedLimit
0x00 Invalid
0x01 1
...
0xFF 255

Byte 3 up to 164/83(Coding Table I / Coding Table II): *CurentStreetName*2
Max. 81 characters, 80 letters plus 1 end of string character

1.4.2.79 TP-LOG-TPL-REQ-239449/A-SID-B2-BTCallerIdentification2_St

Data size: up to 192/111 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0xB2 : BTCallerIdentification2

Byte 1: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 2: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3: BTDeviceIndex

Bit 0-3: Reserved

Bit 4 - 7: BTDevice_Index

0x0 – Reserved
0x1 – BT device index 1
...
0xF – BT device index 15

Byte 4: Status

Bit 0-1: Reserved

Bit 2-4: Phone Type

0x0 - No category
0x1 - Home
0x2 - Office
0x3 - Mobile
0x4 - Other
0x5 – Unknown
0x6 - Fax

Bit 5-7: Validity

0x0 – CLID Incoming call available
0x1 – CLID Second incoming call available
0x2 – CLID Outgoing call
0x3 - CLID Incoming SMS Available
0x4 - CLID Incoming Not available
0x5 - CLID Incoming SMS Not available

Byte 5 up to 191/110 (Coding Table I / Coding Table II):

CallID number Coding Table II fixed

Max. 25 characters, 24 letters plus 1 end of string character.

CallID Name

Max. 81 characters, 80 letters plus 1 end of string character.

1.4.2.80 TP-LOG-TPL-REQ-239745/A-SID-B3-MediaInformation2_St

Data size: up to 493/250 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0xB3: MediaInformation2_St

Byte 1: Utilization

0x17: MP_Media7 – Generic Metadata

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 492/249 (Coding Table I / Coding Table II):

Byte 1:
Bits 0-2: Reserved

Bits 3 - 5: DataUpdate
0x0 Inactive
0x1 Set Operation
0x2 Data refresh

Bits 6 - 7: NonMetadataSrc
0x0 No
0x1 Yes

Byte 2: MetadataIcon_1
0x00 Invalid
0x01.. 0x18 IconID's
0x19 - 0xFF Reserved

Byte 3: MetadataIcon_2
0x00 Invalid
0x01.. 0x18 IconID's
0x19 - 0xFF Reserved

Byte 4:
Metatdata1
Metadata1
80 Characters Max plus 1 end of string character

Metadata2
Metadata2
80 Characters Max plus 1 end of string character

SourceInformation
SourceInformation
80 Characters Max plus 1 end of string character

1.4.2.81 TP-LOG-TPL-REQ-249254/A-SID-B5-BTPhoneName_Rsp

Data size: up to 165/84 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0xB5 : BTPhoneName_Rsp

Byte 1: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 2: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 3 up to 164/83 (Coding Table I / Coding Table II):

BTPhoneName

Max. 81 characters, 80 letters plus 1 end of string character.

1.4.2.82 TP-LOG-TPL-REQ-258519/E-SID-B9-BackupIgnition_Rq

Data size: up to 38 bytes

Byte 0: Signal identifier

0xB9: BackupIgnition_Rq

Byte 1: Utilization

0x32: MobileCom_Service2 – Embedded Modem

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4: Opcode

0x00: Reserved
0x01: Challenge Request
0x02: Challenge Response
0x03: Salt and Check for PaaK with Passwords
0x04: Salt and Check for PaaK without Passwords

0x05: Check for Keys to Enter Valet Mode
0x06: Check for Keys to Exit Valet Mode
0x07: Password Transmit
0x08: Keypad Code Create Request
0x09: Password Delete Request
0x0A: Valet Create Challenge Response
0x0B: Valet Delete Challenge Response
0x0C: Reset Challenge Response
0x0D: Reset 1 Password Transmit
0x0E: Reset 2 Password Transmit
0x0F: Valet Start Challenge Response
0x10-0xFF: Reserved

Byte 5: KeyIndex

0x00: Reserved
0x01: KeyIndex 1
0x02: KeyIndex 2
…
0xFF: KeyIndex 255

Bytes 6 up to 37: VariableData

If Opcode is one of 0x02, 0x07, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E or 0x0F

Bytes 6-37: Password

32 byte SHA256 Hash

If Opcode is 0x08

Bytes 6-9: KeypadCode

Bit 0-10: reserved
Bit 11-13: Seventh Button Press
0x0: Null
0x1: Button 1/2 Pressed
0x2: Button 3/4 Pressed
0x3: Button 5/6 Pressed
0x4: Button 7/8 Pressed
0x5: Button 9/0 Pressed
Bit 14-16: Sixth Button Press
Bit 17-19: First Button Press
Bit 20-22: Second Button Press
Bit 23-25: Third Button Press
Bit 26-28: Forth Button Press
Bit 29-31: Fifth Button Press
0x0: Null
0x1: Button 1/2 Pressed
0x2: Button 3/4 Pressed
0x3: Button 5/6 Pressed
0x4: Button 7/8 Pressed
0x5: Button 9/0 Pressed

Note: For example, a keypad code of 1234567 consists of keypad buttons 1/2, 1/2, 3/4, 3/4, 5/6, 5/6, 7/8. As a bit string, this is represented as 0000 0000 000 $100_{\text{seventh button}}$ $011_{\text{sixth button}}$ $001_{\text{first button}}$ $001_{\text{second button}}$ $010_{\text{third button}}$ $010_{\text{forth button}}$ $011_{\text{fifth button}}$

Note: Sixth and Seventh Button Press parameters shall be set to Null when 5 digit codes are implemented.

***Note**:*
*If **OpCode** = Password Transmit*
*Then **KeyIndex** = KeyIndex, **VariableData** transmitted shall be **Password** = Programmed Hash.*

*If **OpCode** = Password Delete Request*
*Then **KeyIndex** = KeyIndex, **VariableData** shall not be transmitted.*

*If **OpCode** = Valet Delete Challenge Response*
*Then **KeyIndex** = 0x00, **VariableData** transmitted shall be **Password** = Authentication Hash.*

*If **OpCode** = Valet Create Challenge Response*
*Then **KeyIndex** = 0x00, **VariableData** transmitted shall be **Password** = Authentication Hash.*

*If **OpCode** = Keypad Code Create Request*
*Then **KeyIndex** = KeyIndex, **VariableData** transmitted shall be **KeypadCode** = KeypadCode.*

*If **OpCode** = Challenge Response*
*Then **KeyIndex** = 0x00, **VariableData** transmitted shall be **Password** = Authentication Hash.*

*If **OpCode** = Reset Challenge Response*
*Then **KeyIndex** = 0x00, **VariableData** transmitted shall be **Password** = Authentication Hash.*

*If **OpCode** = Reset 1 Password Transmit*
*Then **KeyIndex** = KeyIndex, **VariableData** transmitted shall be **Password** = Programmed Hash.*

*If **OpCode** = Reset 2 Password Transmit*
*Then **KeyIndex** = KeyIndex, **VariableData** transmitted shall be **Password** = Programmed Hash.*

*If **OpCode** = Valet Start Challenge Response*
*Then **KeyIndex** = 0x00, **VariableData** transmitted shall be **Password** = Authentication Hash.*

*All other **OpCodes***
*Then **KeyIndex** = 0x00, **VariableData** shall not be transmitted.*

Programmed Hash is used during Password creation process.
Authentication Hash is used during Start Vehicle and Password Deletion process.

1.4.2.83 TP-LOG-TPL-REQ-258522/E-SID-BA-BackupIgnition_Rsp

Data size: up to 359/195 (Coding Table I/Coding Table II) bytes

Byte 0: Signal identifier
0xBA: BackupIgnition_Rsp

Byte 1: Utilization
0x32: MobileCom_Service2 – Embedded Modem

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Rspcode
0x00: Reserved
0x01: Issue Challenge
0x02: Challenge Response Acknowledge
0x03: Salt and Check for PaaK with Passwords Response
0x04: Salt and Check for Paak without Passwords Response
0x05: Check for Keys to Enter Valet Mode
0x06: Check for Keys to Exit Valet Mode
0x07: Password Response
0x08: Keypad Code Create Response
0x09: Password Delete Response
0x0A: Valet Create Challenge Response Acknowledge
0x0B: Valet Delete Challenge Response Acknowledge
0x0C: Reset Challenge Response Acknowledge
0x0D: Reset 1 Password Response
0x0E: Reset 2 Password Response
0x0F: Valet Start Challenge Response Acknowledge
0x10-0xFF: Not Used

Byte 5: RspStatus
0x00: Reserved
0x01: One PaaK w/o Password and Fob In Vehicle
0x02: One PaaK w/o Password and No Fob In Vehicle
0x03: Fob in Vehicle and No PaaK w/o Password
0x04: Two+ PaaK w/o Password and Fob In Vehicle
0x05: Two+ PaaK w/o Password and No Fob In Vehicle
0x06: No PaaK w/o Password and No Fob In Vehicle
0x07: PaaK No Longer Detected
0x08: Fob No Longer Detected
0x09: PaaK and Fob No Longer Detected
0x0A: Password Already Used
0x0B: Password Created Successfully
0x0C: Password Created Failed
0x0D: Keypad Code Created Successfully
0x0E: Keypad Code Created Failed
0x0F: Valid Password
0x10: Invalid Password
0x11: One PaaK w/ Password and Fob In Vehicle
0x12: One PaaK w/ Password and No Fob In Vehicle
0x13: Fob in Vehicle and No PaaK w/ Password
0x14: Two+ PaaK w/ Password and Fob In Vehicle
0x15: Two+ PaaK w/ Password and No Fob In Vehicle
0x16: No PaaK w/ Password and No Fob In Vehicle
0x17: Password Deleted Successfully
0x18: Password Deleted Failed
0x19: Lockout
0x1A: Keypad Code Duplicate
0x1B: Fob In Vehicle
0x1C: No PaaK and No Fob In Vehicle
0x1D: Password Created Successfully and Delivered to PaaK
0x1E: Password Deleted Successfully, but Keypad Code Deleted Failed
0x1F – 0xFF: Not Used

Bytes 6 up to 358: VariableData

If RspCode is 0x05 or 0x0A:

Bytes 6-9: ValetPassword for 8-digit market

Value: 0x00000000 to 0x05F5E0FF (0 to 99999999)

OR

Bytes 6-10: ValetPassword for 10-digit market

Value: 0x0000000000 to 0x02540BE3FF (0 to 9999999999)

NOTE: For 8-digit markets, only 4 bytes will be sent for the ValetPassword parameter. For 10-digit markets, 5 bytes will be sent for the ValetPassword parameter.

If RspCode is 0x01:

Bytes 6-37: ChallengeNonce

32 byte random number

Bytes 38-53: Salt

16 byte random number

If RspCode is 0x03 or 0x04

Bytes 6-21: Salt

16 byte random number

Byte 22: NumberOfItems

0x00: Reserved
0x01: 1
....
0x04: 4
0xFF: No Entry

Bytes 23 up to 358: Vector

Array(1..NumberOfItems) of record (ItemIndex, KeyID, PhoneName) with Total number of elements defined in NumberOfItems

Byte 0: ItemIndex

0x00: Reserved (1 to 4)
0x01: 1
....
0x04: 4

Byte *1*: KeyIndex

0x00: Reserved
0x01: KeyIndex 1
0x02: KeyIndex 2
…
0xFF: KeyIndex 255

Bytes 2 up to 83/42 (Coding Table I/ Coding Table II Characters): PhoneName

Max. 41 characters, 40 plus 1 end of string

***Note**:*
*If **NumberOfItems** is 0xFF: No Entry then **Vector** Array shall not be transmitted.*

*If **RspCode** = 0x04: Salt and Check For PaaK without Passwords Response*
*And **RspStatus** = One PaaK w/o Password and Fob In Vehicle or*
One PaaK w/o Password and No Fob In Vehicle or
Fob in Vehicle and No PaaK w/o Password or

Two+ PaaK w/o Password and Fob In Vehicle or
Two+ PaaK w/o Password and No Fob In Vehicle or
No PaaK w/o Password and No Fob In Vehicle.
*Then **VariableData** transmitted shall consist of **Salt** = Salt,* **NumberOfItems** *= Number of Items,*
***KeyIndex** = Key Index, **PhoneName** = Phone Name.*

*If **RspCode** = 0x07: Password Response*
*And **RspStatus** = PaaK No Longer Detected or*
Fob No Longer Detected or
PaaK and Fob No Longer Detected or
Password Already Used or
Password Created Successfully or
Password Created Failed.
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x08: Keypad Code Create Response*
*And **RspStatus** = Keypad Code Created Successfully or*
Keypad Code Created Failed or
Keypad Code Duplicate
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x01: Issue Challenge*
*And **RspStatus** = Reserved*
*Then **VariableData** transmitted shall consist of **ChallengeNonce** = Challenge Nonce, **Salt** = Salt.*

*If **RspCode** = 0x02 Challenge Response Acknowledge*
*And **RspStatus** = Valid Password or*
Invalid Password or
Lockout
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x03: Salt and Check For PaaK with Passwords Response*
*And **RspStatus** = One PaaK w/ Password and Fob In Vehicle or*
One PaaK w/ Password and No Fob In Vehicle or
Fob in Vehicle and No PaaK w/ Password or
Two+ PaaK w/ Password and Fob In Vehicle or
Two+ PaaK w/ Password and No Fob In Vehicle or
No PaaK w/ Password and No Fob In Vehicle
*Then **VariableData** transmitted shall consist of **Salt** = Salt,* **NumberOfItems** *= Number of Items,*
***KeyIndex** = Key Index, **PhoneName** = Phone Name.*

*If **RspCode** = 0x09: Password Delete Response*
*And **RspStatus** = Password Delete Successful or*
Password Delete Failed or
Password Deleted Successfully, but Keypad Code Deleted Failed
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x05: Check for Keys to Enter Valet Mode*
*And **RspStatus** = Password Created Successfully or*
Password Created Failed or
Fob In Vehicle or
No PaaK and No Fob In Vehicle or
Password Created successfully and Delivered to PaaK
*Then **VariableData** transmitted shall consist of **ValetPassword** = Valet Password.*

*If **RspCode** = 0x06 Check for Keys to Exit Valet Mode*
*And **RspStatus** = Password Deleted Successfully or*
Password Deleted Failed or
No PaaK andNo Fob In Vehicle or

Password Deleted Successfully, but Keypad Code Deleted Failed
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x0A Valet Create Challenge Response Acknowledge*
*And **RspStatus** = Invalid Password or*
Lockout or
Password Created Successfully or
Password Created Failed
*Then **VariableData** transmitted shall consist of **ValetPassword** = Valet Password.*

*If **RspCode** = 0x0B: Valet Delete Challenge Response Acknowledge*
*And **RspStatus** = Invalid Password or*
Lockout or
Password Deleted Successfully or
Password Deleted Failed or
Password Deleted Successfully, but Keypad Code Deleted Failed
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x0C: Reset Challenge Response Acknowledge*
*And **RspStatus** = Valid Password or*
Invalid Password or
Lockout
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x0D: Reset 1 Password Response*
*And **RspStatus** = PaaK No Longer Detected or*
Password Already Used or
Password Created Successfully or
Password Created Failed
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x0E: Reset 2 Password Response*
*And **RspStatus** = PaaK No Longer Detected or*
Fob No Longer Detected or
PaaK and Fob No Longer Detected or
Password Already Used or
Password Created Successfully or
Password Created Failed
*Then **VariableData** shall not be transmitted.*

*If **RspCode** = 0x0F: Valet Start Challenge Response Acknowledge*
*And **RspStatus** = Valid Password or*
Invalid Password or
Lockout
*Then **VariableData** shall not be transmitted.*

Any combination of RspCode and RspStatus not defined above in this note shall be treated as an invalid combination and shall be ignored.

ValetPassword is an eight-digit numeric value generated by the BLEM. It may be reconstructed into a string using functionality similar to the following: char vpStr[9]; snprintf(vpStr, 9, "%08d", ValetPassword);

1.4.2.84 TP-LOG-TPL-REQ-263484/A-SID-BB-BTGetPhoneName_Rq

Data size: 1 byte.

Byte 0: Signal identifier

0xBB: BTGetPhoneName_Rq

Byte 1: RequestStatus

Bit 0 - 6: Reserved

Bit 7: Status

0x0 – Inactive

0x1 – GetPhoneName

1.4.2.85 TP-LOG-TPL-REQ-258184/G-SID-B6-ChargeProfileLocation_Rq

Max Data size: up to 134/69 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0XB6: ChargeProfileLocation_Rq

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x00: INVALID/INACTIVE

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCode

0x00: Reserved
0x01: Read
0x02: Modify
0x03: Reserved
…...
0xFE: Reserved
0xFF: No Entry

Read:
Transmitter: TCU
Receiver: APIM
Description: It is a command to read full list(10 location labels) from APIM.

Modify:
Transmitter: TCU
Receiver: APIM
Description: Sent when a Charge Location Label is modified or created from Offboard.

Byte 5: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Note: The Maximum number of charge locations that can be returned is limited to 10

Byte 6 up to 457/247 (Coding Table I/Coding Table II): List Info

Array(1..NumberOfItems) of record (ChargeLocationIDNumber, ChargeLocationName)

Record definition (up to 450/240 (Coding Table I/Coding Table II) bytes):

Byte 0: ChargeProfileIDNumber:
0x00: Unknown/Any Location
0x01: Location 1
0x02: Location 2
…
0x09: Location 9
0x0A: Location 10
0x0B: Reserved
...
0xFF: Reserved

Byte 1: up to Byte 44/23 (Coding Table I/Coding Table II)

ChargeLocationName
Max. 20 characters plus 1 End Of String

1.4.2.86 TP-LOG-TPL-REQ-258514/F-SID-B8-ChargeProfileLocation_Rsp

Max Data size: up to 134/69 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier

0XB8: ChargeProfileLocation_Rsp

Byte 1: Utilization

0x81: Charge_Programming_Sevice1 – Charge Programming

Byte 2: Command Execution Status

0x00: INVALID/INACTIVE

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: OpCode

0x00: Reserved
0x01: Read
0x02: Modify
0x03: Reserved
…...
0xFE: Reserved
0xFF: No Entry

Note: APIM will mirror opcode received from TCU in its response. When TCU sends “Read” Opcode the APIM will send response TP message with the full Charge Label list with the “Read” Opcode. When TCU sends “Modify” Opcode the APIM will respond with the full Charge Label list with the “Modify” Opcode.

Byte 5: NumberOfItems

0x00: Reserved
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Note: The Maximum number of charge locations that can be returned is limited to 10

Byte 6 up to 457/247 (Coding Table I/Coding Table II): List Info

Array(1..NumberOfItems) of record (ChargeLocationIDNumber, ChargeLocationName)

Record definition (up to 450/240 (Coding Table I/Coding Table II) bytes):

Byte 0: ChargeProfileIDNumber:
0x00: Unknown/Any Location
0x01: Location 1
0x02: Location 2
…
0x09: Location 9
0x0A: Location 10
0x0B: Reserved
...
0xFF: Reserved

Byte 1: up to Byte 44/23 (Coding Table I/Coding Table II)

ChargeLocationName
Max. 20 characters plus 1 End Of String

1.4.2.87 TP-TPL-REQ-271635/A-SID-BD-LHI_SpeedProfileTableUpdate_Rq

Data size: up to 34 bytes.

Byte 0: Signal identifier

0xBD: LHI_SpeedProfileTableUpdate_Rq

Byte 1: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 2-33: SPTHash

32 Bytes RAW data

1.4.2.88 TP-TPL-REQ-271636/B-SID-BE-LHI_SpeedProfileTableUpdate_Rsp

Data size: up to 3936 bytes.

Byte 0: Signal identifier

0xBE: LHI_SpeedProfileTableUpdate_Rsp

Byte 1: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 2-33: SPTHash

32 Bytes RAW data

Byte 34-35: NbrOfSPTEntries

0x000: NoUpdate
0x001 – 0x12C: NumberOfSPTEntries
0x12D – 0xFFF: Reserved

Byte 36 up to 3935: SPTTableEntriesItemVector

Array(1.. NbrOfSPTEntries) of record (CauseCode, SubCauseCode, EventCode, LHNIconIndex, EventInfo, Priority, SpeedThreshold, ETAThreshold, DistanceThreshold,)

Record definition (13 bytes):

Byte 0: CauseCode

0x00 – 0xFF: CauseCode
0x00 – 0xFF: CauseCode

Byte 1: SubCauseCode

0x00 – 0xFF: SubCauseCode

Byte 2-3: EventCode

0x0 – 0xFFF: EventCode

Byte 4: LHNIconIndex

Bit 0-3: Reserved
Bit 4-7: IconIndex

Byte 5: EventInfo

Bit 0-5: Reserved
Bit 6: IncludesDistance

0x0: FALSE
0x1: TRUE

Bit 7: NotificationLevel

0x0: Background
0x1: PopUp

Byte 6-7: Priority

0x000 – 0x17F: Priority
0x180 – 0xFFF: Reserved

Byte 8: SpeedThreshold

0x00 – 0xFF: Threshold

Byte 9-10: ETAThreshold

0x0000 – 0xFFFF: Threshold

Byte 11-12: DistanceThreshold

0x0000 – 0xFFFF: Threshold

1.4.2.89 TP-LOG-TPL-REQ-271634/E-SID-BF-LHN_EventInfo_St

Data size: up to 169/88 (Coding Table I / Coding Table II) bytes.

Byte 0: Signal identifier

0xBF: LHN_EventInfo_St

Byte 1: Utilization

0x32: MobileCom_Service2 – Embedded Modem; OnlineTraffic
0x33: MobileCom_Service3 – Embedded Modem; Local Hazard Information

Byte 2: Command Execution Status

0x0y: Final Result	–	Success
0x1y: Final Result	–	Fail
0x2y: Final Result	–	Information
0x3y: Intermediate Result	–	Wait

For exact CES value definition see TP-REQ-015134-CES Table (TcSE ROIN-138094-3)

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: EventInformation

Bit 0-3: EventTypeIcon

0x0:	None
0x1:	General
0x2:	Road Works
0x3:	Obstacle
0x4:	End of Traffic Jam
0x5:	Broken Down Vehicle
0x6:	Fire
0x7:	Hazardous Driving Condition
0x8:	Object on the road
0x9:	Animals on the road
0xA:	People on roadway
0xB:	Vehicle on wrong Carriageway
0xC – 0xF:	Reserved

Bit 4-6: DistanceUnitUsed

0x0: Meter
0x1: Kilometer
0x2: Feet
0x3: Yards
0x4: Miles
0x5-0x7: Reserved

Bit 7: NotificatioLevel

0x0: Background
0x1: PopUp

Byte 5-6: Distance

0x0000 – 0xFFFE: Distance
0xFFFF: NoDistance

Byte 7 up to 168/87 (Coding Table I / Coding Table II):

EventDescription

Max. 81 characters, 80 letters plus 1 end of string character.

1.4.2.90 TP-LOG-TPL-REQ-241970/F-SID-B4-PaaKESN_St

Data size: up to 1005 (Coding Table III) bytes

Byte 0: Signal identifier

0xB4: PaaKESN_St

Byte 1: Utilization

0x32: MobileCom_Service2 – Embedded Modem

Byte 2: Command Execution Status

0x00: Invalid/Inactive

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4: BLEMProvDID

0x50: FactoryMode
0x51: Unprovisioned (BLEM Configured, FIMCO not complete)
0x52: BLEMProvAlertACK
0x53: ReadyForKeyDelivery
0x54: KeyDelivered
0x55 – 0xFF: Reserved

Byte 5 up to 1004 (Coding Table III):

BLEMSyncPPacket
Max. 1000 byte Variable Raw Data

1.4.2.91 TP-LOG-TPL-REQ-324830/C-SID-C0-Trailer_Settings_St

Data size: up to **95/51** (Coding Table I / Coding Table II) byte

Byte 0: Signal identifier

0xC0: Trailer_Settings_St

Byte 1: Utilization

0x76 Data_Service6 – Trailer Settings

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Pro TBA Status

0x0 - Null
0x1 - Not Setup
0x2 - Ready

Byte 5: Trailer Reverse Guidance Status

0x0 - Null
0x1 - Not Setup
0x2 - Ready

Byte 6: Trailer Blind Spot Status

0x0 - Null
0x1 - Off
0x2 - Not Setup
0x3 - Not Available
0x4 - Ready

Byte 7 up to 88/44 (Coding Table I / Coding Table II): Trailer Mileage

Mileage:
Fixed 7 characters long string.

Trailer Average Fuel Economy:
Max 6 characters, 5 for fuel data and 1 end of string character.

Trailer Name:
Max 31 characters, 30 characters (for the name) and 1 end of string character.

In BEV vehicles, the character set designed for Trailer Average Fuel Economy will be used to indicate Trailer Range per Full Charge instead.

1.4.2.92 TP-LOG-TPL-REQ-404925/B-SID-DC-DigitalKeyList_Rq

Data size: up to 7 (Coding Table III) bytes

Byte 0: Signal identifier
0xDC: DigitalKeyList_Rq

Byte 1: Utilization
0x32: MobileCom_Service4 - NFC

Byte 2: Command Execution Status
0x00: Invalid/Inactive

Byte 3: Character Coding
Bit 0-5: Reserved

Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4: OpCode
0x0: Reserved
0x1: Read
...
0x2..0xFF: Reserved

Byte 5: NumberOfItems
0x00: Invalid
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

Byte 6: StartIndex
0x00: Invalid
0x01: 1
0x02: 2
....
0xFE: 254
0xFF: No Entry

1.4.2.93 TP-LOG-TPL-REQ-404926/D-SID-DD-DigitalKeyList_Rsp

Data Size: up to 181 (Coding Table I) bytes

Byte 0: Signal Identifier
0xDC: DigitalKeyList_Rsp

Byte 1: Utilization
0x34: MobileCom_Service4 - NFC

Byte 2: Command Execution Status
0x0y: Final Result – Success

0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 bytes per char)

Byte 4: List Size

0x00: Inactive
0x01: List Size 1
…
0xFE: List Size 254
0xFF: No Entry

Byte 5: Total Number Of Keys Available

0x00: Inactive
0x01: 1 Key Available
…
0xFE: 254 Keys Available
0xFF: No Entry

Byte 6: Additional Key Storage Available

0x00: No
0x01: Yes
…
0x02-0xFE: Reserved
0xFF: No Entry

Byte 7 up to 180 (Coding Table I): Vector

Array (1…N) of record (IndexNumber, DeviceType, KeyType, KeyStatus, LocalID, FriendlyName, FESN, PairingID) with TotalNumberOfKeysAvailable defined in ListSize

Record definition (up to 174 (Coding Table I) bytes):
Byte 0: ItemIndex
0x00 Inactive
0x01 Index 1
…
0xFF Index 255

Byte 1: DeviceType
0x00: NFC Card
0x01: Digital Key
0x02: CAK
0x03 - 0xFF: Reserved

Byte 2: KeyType
0x00: Factory
0x01: Retail User
0x02: Fleet User
0x03 - 0xFF: Reserved

Byte 3: KeyStatus
0x00: Pending Add
0x01: Pending Delete
0x02: Added/Confirmed
0x03 - 0xFF: Reserved

Byte 4-7: LocalID
0x00000000: Inactive
0x00000001: ID 1
0x00000002: ID 2
…
0xFFFFFFFF ID 4294967295

Byte 8 up to 173 (Coding Table I):
FESN
Max. 9 characters, 8 plus 1 end of string

FriendlyName
Max. 65 characters, 64 plus 1 end of string

PairingID
Max. 9 characters, 8 plus 1 end of string

Note:
If there are no keys in the list, List Size and Total Number Of Keys Available = 0xFF: No Entry
The Vector Array shall not be transmitted

Note:
When DeviceType = 0x01: DigitalKey, FESN shall be end of string (0x00)
When KeyStatus = 0x00: Pending Add, PairingID shall be end of string (0x00)

1.4.2.94 TP-LOG-TPL-REQ-404927/C-SID-DE-DigitalKey_Rq

Data Size: up to 157 (Coding Table I) bytes

Byte 0: Signal Identifier
0xDE: DigitalKey_Rq

Byte 1: Utilization
0x34: MobileCom_Service4 - NFC

Byte 2: Command Execution Status
0x00: Invalid/Inactive

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 bytes per char)

Byte 4: OpCode
0x00: Reserved
0x01: AddKey
0x02: DeleteKey
0x03: DeleteAllKeys
0x04: CancelRequest
0x05 - 0xFF: Reserved

Byte 5-8: LocalID
0x00000000: Inactive
0x00000001: ID 1
0x00000002: ID 2
…
0xFFFFFFFF ID 4294967295

Byte 9 up to 156 (Coding Table I):
FriendlyName
Max. 65 characters, 64 plus 1 end of string

PairingID
Max. 9 characters, 8 plus 1 end of string

Note:
When OpCode = 0x02: DeleteKey, FriendlyName will be end of string (0x00)
When OpCode != 0x02: DeleteKey, PairingID will be end of string (0x00)
LocalID is only applicable when OpCode = 0x04: CancelRequest
LocalID will be 0x00000000 when OpCode != 0x04: CancelRequest

1.4.2.95 TP-LOG-TPL-REQ-404928/C-SID-DF-DigitalKey_Rsp

Data Size: up to 154 (Coding Table I) bytes

Byte 0: Signal Identifier
0xDF: DigitalKey_Rsp

Byte 1: Utilization
0x34: MobileCom_Service4 - NFC

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result – Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)

Byte 4: OpCode
0x00: Reserved
0x01: AddKey

0x02: DeleteKey
0x03: DeleteAllKeys
0x04: CancelRequest
0x05 - 0xFF: Reserved

Byte 5: Request Status
0x00: Reserved
0x01: Final Success
0x02: Final Rejected
0x03: Final Timeout
0x04: Final System Error
0x05: Success - Request Sent – Approval Required
0x06: Rejected - No space available
0x07: Rejected - Already pending
0x08: Rejected - Already programmed
0x09: Rejected - Tap timeout
0x0A: Rejected - Not programmed to vehicle
0x0B: Rejected - System Error
0x0C: Waiting for Card Tap
0x0D: Rejected - No Connectivity
0x0E: Success - Request Sent – No Approval Required
0x0F - 0xFF: Reserved

Byte 6 up to 153 (Coding Table I):
FESN
Max. 9 characters, 8 plus 1 end of string

FriendlyName
Max. 65 characters, 64 plus 1 end of string

Note:
When OpCode = 0x01: AddKey, FESN shall be end of string (0x00)
When OpCode = 0x02: DeleteKey, FriendlyName shall be end of string (0x00)
When Request Status = 0x05 - 0x0D, FESN & FriendlyName shall be end of string (0x00)

1.4.2.96 TP-LOG-TPL-REQ-415737/A-SID-F0-Track_Apps_St

Data size: up to 20 (Coding Table III) bytes

Byte 0: Signal identifier
0xF0: Track_Apps_St

Byte 1: Utilization
0x77: Data_Service7 – Track_Apps

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4 Feature type

0x0: Acceleration Timer, 0-30 mph
0x1: Acceleration Timer, 0-50 kph
0x2: Acceleration Timer, 0-60 mph
0x3: Acceleration Timer, 0-100 kph
0x4: Acceleration Timer, 0-100 mph
0x5: Acceleration Timer, 0-200 kph
0x6: Acceleration Timer, 1/8 mile
0x7: Acceleration Timer, 200 m
0x8: Acceleration Timer, ¼ mile
0x9: Acceleration Timer, 400 m
0xA: Brake Performance, 60-0 mph
0xB: Brake Performance, 100-0 kph
0xC: Brake Performance, 100-0 mph
0xD: Brake Performance, 200-0 kph
0xE: Lap Timer (English)
0xF: Lap Timer (Metric)

Byte 5 up to 20 : Track apps data

Refer to Track Apps SPSS, TP Content section about how to generate or derive this data.

1.4.2.97 TP-LOG-TPL-REQ-422319/A-SID-E2-UpdatedPresetInfo_St

Data size: up to 73/47 (Coding Table II / Coding Table I) bytes:

Byte 0: Signal identifier

0xE2: UpdatePresetInfo_St

Byte 1: Utilization

0x07: Radio_Service1 – Radio General

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Opcode

0x00: Reserved
0x01: Confirm Presets Stored
0x02: Transmit Stored Preset Content
0x03 – 0xFF: Reserved

Byte 5: PresetNumber

0x00 – Reserved
0x01 – Preset 1
0x02 – Preset 2
...
0x1E – Preset 30
0xFF – No valid preset

Byte 6: RadioBand

0x0 – Invalid
0x1 – AM
0x2 – FM
0x3 – DAB

Byte 7-8: Stored Frequency/Block Number

0x0000 – 0
0x0001 – 1
…
0x0615 – 1557
0x0616 – Reserved
…
0xFFFF – Reserved

AM: Freq = 153+ Offset kHz. Offset 0..1557
*FM: Freq = 76+ Offset*0.05 MHz. Offset 0..640*
Selected tuned band determine frequency (kHz or MHz).

DAB: frequency/BlockNumber = Bitfield:
Bit 0 .. 4:
Band III: Numeric value(A=1 .. W=23); hex coded
Bit 5 .. 8:
Band III: Numeric value (default value: 0h), hex coded

Byte 9-10: Last Used Frequency/Block Number

0x0000 – 0
0x0001 – 1
…
0x0615 – 1557
0x0616 – Reserved
…
0xFFFF – Reserved

Byte 11: HD Program Number

0x00 – Not Applicable
0x01 – HD 1
0x02 – HD 2
0x03 – HD 3
0x04 – HD 4
0x05 – HD 5
0x06 – HD 6
0x07 – HD 7
0x08 – reserved
…
0x3F reserved

Byte 12-13: PI-Code

0x0000 – 0xFFFF

Byte 14-15: SCID

0x0000 – Invalid
0x0001 - 0xFFFF

Byte 16-17: SID

0x0000 – Invalid
0x0001 - 0xFFFF

Byte 18-19: Service Link Info (DAB = SID, FM = PI-Code)
0x0000 – 0xFFFF

Byte 20-21: Service Link Time Delay (DAB to FM or DAB to DAB) resolution 10ms
0x0000 = 00.00 seconds
0x0064 = 01.00 seconds
…..
0x03E8 = 10.00 seconds
0x03E9 0xFFFF = Reserved

Byte 22 up to 55/38 (Coding Table II / Coding Table I): StationNameLong
Up to 17 characters 16 letters plus 1 End Of String character

Note: StationNameLong = DAB: ServiceName = 16 character long name max plus EOS;
AMFM = EOS

Byte 56/39 up to 73/47 (Coding Table II / Coding Table I): StationNameShort
Up to 9 characters 8 letters plus 1 End Of String character

Note: StationNameShort = 8 character short name max plus EOS;
RDS Markets:
PSName = 8 characters max
Non RDS Markets:
AMFM = EOS

1.4.2.98 TP-LOG-TPL-REQ-425139/B-SID-E3-BTConnection_Rq

Data size: up to 14 (Coding Table III) bytes

Byte 0: Signal identifier
0xE3: BTConnection_Rq

Byte 1: Utilization
0x12: MP_Media2 – BT Audio Streaming

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF RawData (Hexadecimal Notation)

Byte 4: Opcode
0x00: Reserved
0x01: Connect
0x02: Disconnect
0x03:Transfer RandomIDs
0x04 – 0xFF: Reserved

Byte 5: Seat Location
0x00: Reserved
0x01: Reserved
0x02: Seat2

0x03: Seat3
0x04: Seat4
0x05 – 0xFF: Reserved

If Opcode is 0x01

Byte 6-11: MAC Address

6 byte MAC Address

If Opcode is 0x03

Byte 6-11: RandomIDA

6 byte Random ID A

Byte 12-17: RandomIDB

6 byte Random ID B

Note: If Opcode not equal 0x01 or 0x03, Everything after Byte 5 will not be sent.

Note: RandomIDA and RandomIDB will be 46 bits with lead characters are 0

Ex Random IDs: 3F FF FF FF FF FF
RandomIDA Byte 6 can't excide 3F
RandomIDB Byte 12 can't excide 3F

1.4.2.99 TP-LOG-TPL-REQ-425150/A-SID-E4-BTConnection_Rsp

Data size: up to 12 (Coding Table III) bytes

Byte 0: Signal identifier

0xE4: BTConnection_Rsp

Byte 1: Utilization

0x12: MP_Media2 – BT Audio Streaming

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved
Bit 6-7: Coding
0x2: Coding Table III
0x00-0xFF Raw data Hex

Byte 4: Opcode

0x00: Reserved
0x01: Pairing
0x02: Connecting
0x03: Connected
0x04:Disconnected
0x05 – 0xFF: Reserved

Byte 5: Seat Location

0x00: Reserved
0x01: Reserved

0x02: Seat2
0x03: Seat3
0x04: Seat4
0x05 – 0xFF: Reserved

If Opcode is 0x01
Byte 6-11: PAC Random Address
6 byte PAC Random Address

Note: If Opcode not equal 0x01, Everything after Byte 5 will not be sent.

1.4.2.100 TP-LOG-TPL-REQ-434497/A-SID-E5-SDARS_ChannelName2_St

Data size: up to 72/38 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier
0xE5: SDARS_ChannelName2_St

Byte 1: Utilization
0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding
Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 71/37 (Coding Table I / Coding Table II):
GCI Channel Long Name
Max. 25 characters, 24 characters plus 1 end of string character.

GCI Channel Short Name
Max. 9 characters, 8 characters plus 1 end of string character.

1.4.2.101 TP-LOG-TPL-REQ-434498/A-SID-E6-SDARS_DynamicContentName_St

Data size: up to 54/29 (Coding Table I / Coding Table II) bytes

Byte 0: Signal identifier
0xE6: SDARS_DynamicContentName_St

Byte 1: Utilization
0x02: Radio_Service2 – SDARS

Byte 2: Command Execution Status
0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4 up to 53/28 (Coding Table I / Coding Table II):

DynamicNameContent
Max. 25 characters, 24 characters plus 1 end of string character.

1.4.2.102 TP-LOG-TPL-REQ-434524/A-SID-E7-NavigationSymbolInfo2_St

Data size up to 74/41 (Coding Table I / Coding Table II):

Byte 0: Signal identifier

0xE7: NavigationSymbolInfo2_St

Byte 1: Utilization

0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding
0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Property Of Distance

0x0 – bargraph
0x1 – length

Byte 5: Unit Of Length

0x0 - Unknown
0x1 – Kilometers
0x2 – Meters
0x3 – Miles
0x4 – Yards
0x5 – Feet

Byte 6: BargraphSteps

Values: 0x00 up to 0xFF

NOTE:
The relative size of bargraph (0% – 100% = 0x00 – 0xFF). The BargraphSteps value decreases from 0xFF at start down to 0x00 when the decision point is reached.

Byte 7: Symbol Value

Values: 0x0000 to 0xFFFF

Note: See NAVREPEAT-SR-420262-NavigationSymbolInfo2.St - list of available icons for Repeater display

Byte 8 up to 73/40 (Coding Table I / Coding Table II):

Distance To Next Maneuver

Max. 33 characters, 32 characters plus 1 end of string character.

1.4.2.103 TP-LOG-TPL-REQ-436877/A-SID-E8-DistanceToDestination2_St

Data size up to 71/38 (Coding Table I / Coding Table II):

Byte 0: Signal identifier

0xE8: DistanceToDestination2_St

Byte 1: Utilization

0x22: Nav_Service2 – Navigation

Byte 2: Command Execution Status

0x0y: Final Result – Success
0x1y: Final Result – Fail
0x2y: Final Result – Information
0x3y: Intermediate Result– Wait

Byte 3: Character Coding

Bit 0-5: Reserved

Bit 6-7: Coding

0x0: Coding Table I
0x0000-0xFFFF UNICODE UTF-16 (2 byte per char)
0x1: Coding Table II
0x00-0xFF Latin-9 (1 byte per char)

Byte 4: Unit Of Length

0x0 - Unknown
0x1 – Kilometers
0x2 – Meters
0x3 – Miles
0x4 – Yards
0x5 - Feet

Byte 5 up to 70/37 (Coding Table I / Coding Table II):

Distance To Next Maneuver

Max. 33 characters, 32 characters plus 1 end of string character.

2 Appendix: Reference Documents

Reference #	Document Title
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	