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|  | Drive Video Record Feature | | |  |
|  | (F006930) | | |  |
|  |  | | |  |
|  |  | | |  |
| Document Type | **Feature Implementation Specification (FIS)** | | |  |
| Template Version | **6.1a** | | |  |
| Document ID | **/** | | |  |
| Document Location | **/** | | |  |
| Document Owner | **Kobe Niu** | | |  |
| Document Version | **1.0** | | |  |
| Document Status | **Draft** | | |  |
| Date Issued | **2022/10/07** | | |  |
| Date Revised |  | | |  |
| Document Classification | GIS1 Item Number: | **27.60/35** | |  |
| GIS2 Classification: | **Confidential** | |
|  | | | | |
|  | | | | |
| Document Approval | | | | |
| Person | Role | | Email Confirmation | Date |
|  |  | |  |  |
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# Introduction

## Document Purpose

The Feature Implementation Specification (FIS) specifies the deployment of the logical functions of a feature to an electrical architecture. The FIS specifies all interactions between the ECUs of the electrical architecture required for the feature including the technical signals and the interfaces. It also gives interface and integration requirements, which are specific to the feature for the electrical architecture.

To get more information about the concept of feature, function and component level abstraction refer to the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features).

## Document Scope

This FIS describes the deployment of the feature <Drive Video Record> to the following electrical architecture(s):

| **Electrical Architecture Name** | **Owner** | **Reference** |
| --- | --- | --- |
| FNV2.1 | YNIU6 | / |
|  |  |  |

Table 1‑1: Electrical Architecture(s) referenced in this document

## Document Audience

The FIS is authored by <Emma Chen / Feature Owner Supervisor>. All Stakeholders, i.e., all people who have a valid interest in the feature implementation should read and, if possible, review the FIS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FIS.

### Stakeholder List

For the latest list of the function stakeholders and their roles & responsibilities refer to <TBD>.

## Document Organization

### Document Context

Refer to the [Specification Structure page](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates) in the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features) to understand how the FIS relates to other Ford Requirements Documents and Specifications.

### Document Structure

The structure of this document is explained below:

**Section 1** – Introduction – Giving an explanation how to use this document including responsibilities and the scope of the document. Additionally it contains the revision history and a list of unsettled but known issues that have to be consolidated in future versions. It explains the terminology and gives a clarification of the definitions, concepts and abbreviations used in the document.

**Section 2** – Feature Implementation Description – Giving an overview of the platform and listing assumptions, constraints or dependencies

**Section 3** – Feature Implementation Architecture – Describing 3 Architecture Views:

* Functional Architecture – Showing the logical architecture of functions
* Physical Architecture – Showing the physical architecture (first of all the E/E Architecture), which the Logical Functions get allocated to.
* Software Architecture – Showing the software architecture relevant for the feature (for features with in-house development only)
* Function Deployment – Presenting the allocation of logical functions and signals to the electrical and other components

**Section 4** – Deployment Specific Modeling –Modeling techniques providing additional detail on e.g. interface behavior

**Section 5** – Deployment Specific Requirements – Deployment specific requirements for ECUs, Network Communication, and Process

**Section 6** – List of Open Concerns

**Section 7** – Revision History

**Section 8** – Appendix - Presenting additional data mainly in a tabular form, e.g., a data dictionary

## References

### Ford Documents

The list of all Ford internal documents, which are directly related.

| **Reference #** | **Title** | **Doc. ID** | **Revision** | **Document Location** |
| --- | --- | --- | --- | --- |
| 1 | Drive Video Record Feature B-Diagram v1.0 | / | V1.0 | / |
| 2 | Drive Video Record Feature Level Specification v1.2 | / | V1.2 | / |
| 3 | Drive Video Record UART Protocol v1.0 | / | V1.0 | / |
|  |  |  |  |  |

Table 1‑2: Ford internal Documents

### External Documents and Publications

The list of external documents could include books, reports and online sources.

| **Reference #** | **Document / Publication** |
| --- | --- |
| 1 | GBT 38892-2020 |
|  |  |

Table 1‑3: External documents and publications

## Glossary

### Definitions

| **Definition** | **Description** |
| --- | --- |
|  |  |

Table 1‑4: Definitions used in this document

### Abbreviations

| **Abbr.** | **Stands for** | **Description** |
| --- | --- | --- |
| DVR | Drive Video Record |  |
| APIM | Auxiliary Protocol Interface Module | DVROnboardClient in DVR system |
| ECG | Enhanced Central Gateway |  |
| FNV X.X | Fully Networked Vehicle Architecture X.X |  |
| HMI | Human Machine Interface |  |
| IDCM | Integrated Dash Camera Module | DVRServer in DVR system |
| POC | Powered On Cable |  |

Table 1‑5: Abbreviations used in this document.

# Feature Implementation Overview

## Description

The DVR system is designed for FNV2.1 and SYNC+ platform, it could support to capture the video of exterior environment automatically, and when collision happens, will capture/save a special video labeled as “emergency”, user could also trigger the video/image record manually to save the beautiful view or important scene, at the same time, the necessary information like VIN, date, time will be saved. Users could also preview/playback the video/image and config the system via the center stack or Ford APP, DVR will also provide vehicle monitor ability after ignition off. DVR user could save the data on an external TF card or download to a smart phone via Wi-Fi.

## Input Requirements/Documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference** | **Section/Requirement** | **Description** | **Derived Requirement** |
| **Feature/Function Requirements** | | | |
| 1 | Drive Video Record Feature B-Diagram | B Diagram of DVR feature | / |
| 2 | Drive Video Record Feature Level Specification | Feature & Function spec | / |
| 3 | Drive Video Record UART Protocol | DVR related ECU communication interface protocol | / |
| **Ford Engineering Standards** | | | |
|  |  |  |  |
| **Legal Regulations** | | | |
| 1 | GBT 38892-2020 |  | / |
| **Industry Standards** | | | |
|  |  |  |  |
| **Other Sources** | | | |
|  |  |  |  |

Table 6: Input Requirements/Documents

## Lessons Learned

DVR is a lead feature in Ford, so no lesson learned exist, benchmark study to other OEM is the reference for L&L.

## Assumptions

Key DVR assumptions below:

1. IDCM and APIM communication relays on an internal connection, for DVR it’s UART over LVDS cable.
2. All DVR video or photo data saved by IDCM, should not be able to upload to Ford backend or any 3rd party cloud.

# Feature Implementation Architecture

## Functional Architecture

### Description

DVR feature contains several functions list below

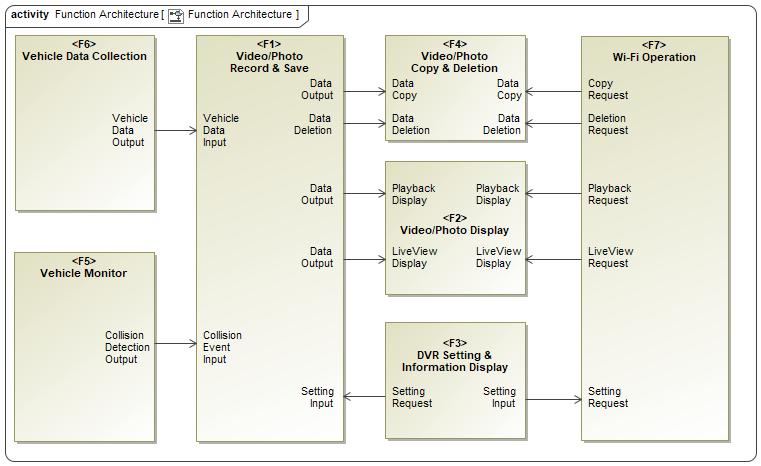


Figure 3‑1: Functional Architecture

### Function List

The following functions from the [Global Feature & Function List](https://www.vsemweb.ford.com:443/tc/launchapp?-attach=true&-s=226TCSession&-o=ZmZNi0JHx3NrTDAAAAAAAAAAAAA) are referenced in this Feature Implementation Specification:

|  |  |  |
| --- | --- | --- |
| **Function ID** | **Function Name** | **Function Description** |
| / | Video & Photo Record and Saving | DVR video and photo data record and saving when event triggered like normal/emergency/manual record request. |
| / | Video & Photo Display | DVR video and photo display in APIM or Ford APP, include live view and playback. |
| / | DVR Setting and Information Display | DVR function setting via APIM or Ford APP, and key information display. |
| / | Video & Photo Copy and Deletion | Copy DVR data from IDCM internal memory to TF card, or delete DVR data from TF card. |
| / | Vehicle Monitoring | Monitor vehicle collision event and record video when IGN off. |
| / | Vehicle Data Collection | Collect key vehicle data for video water mark and support emergency event detection. |
| / | Wi-Fi Connection & Communication | Support Wi-Fi connection to DVR user’s smart phone, and communication between IDCM and Ford APP. |

Table 3‑1: List of Functions

### Signal List

Refer to < Drive Video Record UART Protocol >.

## Physical Architecture

### E/E Architecture

#### E/E Architecture Variants

|  |  |  |
| --- | --- | --- |
| E/E Architecture Variant Name | Variant Description | Variant Condition (optional) |
| FNV 2.1 | Work on FNV2.1 platform | Network Topology = FNV2.1 |

##### E/E Architecture FNV2.1

This E/E Architecture variant FN2.1 supports APIM and APP works as HMI for DVR feature, APIM will collect DVR water mark information from ECG, IDCM outputs video to APIM and APP.

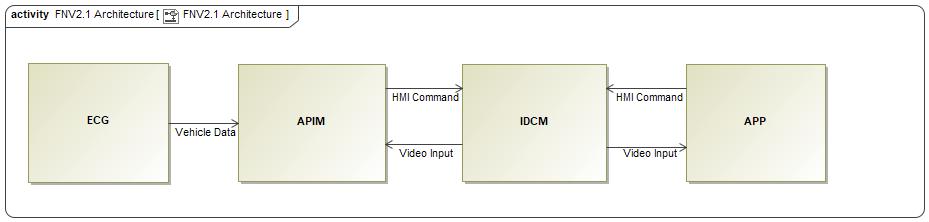


Figure 3‑2 E/E Architecture (SysML Style)

#### E/E Components

|  |  |
| --- | --- |
| Component Name | **Description** |
| APIM | Auxiliary Protocol Interface Module |
| ECG | Enhanced Center Gateway |
| IDCM | Integrated Dash Camera Module |
| Ford APP | Ford APP like FordPass/LinclonWay on Smart Phone |

Table 3‑2: Electrical Components

#### E/E Connections

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Connection Name | **Connection Type** | **Protocol**  Only if ‘Connection Type’ is “Network”/”RF-Digital” | **Description** | **Allocated Messages**  Only if ‘Connection Type’ is “Network”/”RF-Digital” | **Connected Nodes** |
| UART | Digital | n/a | UART connection between IDCM and APIM over FPD-Link | n/a | IDCM & APIM |
| WIFI | RF-Digital | n/a | WIFI connection between IDCM and smart phone | n/a | IDCM |
| LVDS | Analog | n/a | Event Notification Signal | n/a |  |
|  |  |  |  |  |  |

Table 3‑3: E/E Connections

#### Signal List

Refer to < Drive Video Record UART Protocol >.

## Function Deployment

### Deployment Variants

|  |  |  |
| --- | --- | --- |
| **Deployment Variant Name** | Variant Description | Variant Condition (optional) |
| FNV 2.1 | Work on FNV2.1 platform | Network Topology = FNV2.1 |

### Function Allocation

| Component | Logical Function Name | Technology Function Name |
| --- | --- | --- |
|
| IDCM  DVRServer | Video Record and Save | Save Location Allocation |
| Video Data Naming |
| Video Watermark | Mandatory Data Collection |
| Optional Data collection |
| GPS Date Synchronization |
| Normal Video Record | Normal Video Saving |
| Memory Check and Overwrite |
| Error Handling |
| Emergency Video Record | Collision Detection |
| Emergency Video Saving |
| Error Handling |
| Manual Video Record | Manual Command Receive |
| Manual Video Saving |
| Error Handling |
| Video Liveview | Liveview Command Receive |
| Liveview Data Transfer |
| Video/Photo Playback | Playback Command Receive |
| Playback List Creation |
| Playback Data Transfer |
| Video Stop |
| Video Play |
| Video Forward & Backward |
| Gear Position Protection |
| DVR Setting | Setting Value Receive |
| Setting Value Take Effect |
| Wi-Fi Setting | Wi-Fi SSID Receive |
| Wi-Fi SSID Take Effect |
| Wi-Fi Password Receive |
| Wi-Fi Password Take Effect |
| DVR Data Copy to TF Card | TF Card Status Check |
| Copy File List Receive |
| Data Move from eMMC to TF Card |
| Data Move from eMMC to Smartphone |
| Smart Copy Command Receive |
| DVR Data Delete from TF Card | Delete File Receive |
| Data Delete from TF Card |
| Vehicle Monitoring | Collision Detection |
| Emergency Video Saving |
| Notification to APIM |
| Wi-Fi Connection | Connection Setup & Reconnection |
| Liveview Data send |
| Playback List Data Send |
| Playback Control |
| DVR Data Download |
| DVR System Error Handling | Camera Sensor Error Handling |
| Internal Memory Error Handling |
| TF Card Error Handling |
| Wi-Fi Error Handling |
| APIM  DVROnboardClient | AR Feature Adaptation | AR Feature Work Status Judgement |
| Vehicle Data Collection | GPS Date and Time Package |
| Internal Data Collection |
| CAN Data Collection |
| Vehicle Data Send to IDCM |
| Normal Video Record Switch | Normal Video Record On/Off control Logic |
| Request Switch HMI |
| DVR Launcher Interface | Main Page Launcher |
| Quick Panel Launcher |
| Local APP Launcher |
| Voice Control Launcher |
| Video Liveview | Enter Liveview |
| Video Receive |
| Video display |
| Video/Photo Playback | Enter Playback |
| Playback List Receive and Display |
| Video/Photo Playback Display |
| Screenshot Command |
| Last/Next File Command |
| Forward & Backward Command |
| Play/Stop Command |
| Gear Position Pretection |
| DVR Setting | Setting Value Command |
| Back to Default Value |
| IDCM Information Update & Display |
| Format TF Card Command |
| DVR Data Copy to TF Card | Smart Copy Command |
| Copy List Create |
| Copy Status Display |
| Background Copy |
| Cancel Copy |
| ~~DVR Data Copy to Smart Phone~~ | ~~Copy List Create~~ |
| ~~Copy Status Display~~ |
| ~~Background Copy~~ |
| ~~Cancel Copy~~ |
| DVR Data Delete from TF Card | Delete List Create |
| Delete Status Display |
| Vehicle Monitoring | Vehicle Monitoring Status Display |
| DVR Status Display | DVR Status Icon Update |
| DVR Dash Card Image Update |
| Manual Photo Record | Manual Photo Command – Soft Button |
| Manual Photo Command – Voice Control |
| Manual Photo Status Display |
| Manual Video Record | Manual Video Command – Soft Button |
| Manual Video Command – Voice Control |
| Manual Video Stop Control |
| Manual Video Status Display |
| Other DVR Interface Disable |
| Emergency Video Record | Emergency Video Status Display |
| Other DVR Interface Disable |
| DVR Error Display | DVR Error Status Display |
| APP  DVROffboardClient | Wi-Fi Connection | Connection Setup & Reconnection |
| Wi-Fi Error Handling |
| Video Liveview | Liveview Launcher |
| Liveview Display |
| Video Playback | Playback List Display |
| Video Playback Control |
| Video Download | DVR Data Download Receive and Save |
| Download Status Display |

Table 3‑5: Function Allocation Table (Basic)

# Feature Implementation Modeling

## Component Interaction Diagrams

### Scenario: “System Startup / Shutdown”

### Scenario: “Video Record and Saving”

### Scenario:



**Figure 12:** Sample Scenario “Normal Operation”

## Component Interface Behavior Diagrams

*#Hint: For complex (application level) interface protocols a protocol state machine would be more appropriate than a bunch of sequence diagrams to illustrate the interactions between components. So, this section would typically show a (protocol) state machine.*

# Feature Implementation Requirements

## Functional Safety

Feature is not Function Safety critical – QM level. NA.

## Requirements on Components

High level functions breakdown:



### IDCM -- DVRServer

#### Technology Function Normal Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Normal\_Record\_Setting | Normal Video Record Switch | **UART msg**: APIM\_NormalVideoSwitch\_Enum [Type:0x15] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Normal Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Normal Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Video Record Process

IDCM should start normal video record base on below inputs:

* *DVR system self-test is ok*
* *Normal video is Enabled (Normal Video Record Switch == Normal Video Enabled)*

Once above condition is met, IDCM should start to normal recording, and output below msg:

* *Video Record Status == Normal Recording*

After record complete, IDCM should set *Video Record Status back to last available value.*

###### Emergency Video Record Attributes

According to GB/T 38892, all normal video must be saved into eMMC without modification. The default normal video duration is 3 minutes and should be saved into eMMC “Normal Data” folder.

Naming rule: NOR-<Year-Month-Day Hour-Minute-Second>.mp4.

#### Technology Function Emergency Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Veh\_Speed | Vehicle Speed | **UART msg**: APIM\_VehicleSpeed\_Int [Type:0x12] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Veh\_Brake\_Status | Vehicle Brake Pedal Status | **UART msg**: APIM\_Brake\_Enum [Type:0x12] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Emergency Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Recording\_Timestamp | Video Recording Timer | **UART msg**: IDCM\_ProgressSync\_Enum [Type:0x02] [Subtype:0x02]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Emergency Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Emergency Video Record Process

IDCM should has the ability to detect the vehicle collision base on below inputs:

* *Internal G-Sensor detection*
* *Vehicle Speed*
* *Vehicle Brake Pedal Status == Driver\_Braking*

Once trigger condition is met, IDCM should start to emergency record, also synchronize the recording timestamp to APIM every 500ms:

* *Video Record Status == Emergency Recording*
* *Video Recording Timer == “Corresponding recording timestamp”*

After recording complete, IDCM should set *Video Record Status back to last available value.*

###### Emergency Video Record Attributes

If normal video record is enabled, video duration should contain 15 seconds before trigger event and 30 seconds after trigger event. If normal video record is disabled, emergency video should only contain 30 seconds after collision detected. The “30 seconds” is configurable through DVR setting page on APIM. Emergency video should be saved into eMMC “Key Data” folder.

Video naming rule: EVT-<Year-Month-Day Hour-Minute-Second>.mp4

###### Other Video Record Inhibition

Emergency video record shall not impact normal video recording, and will interrupt manual video or photo record.

#### Technology Function Manual Photo Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Manual\_Photo\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Photo Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Manual\_Photo\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Manual\_Photo\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Photo\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Photo Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Manual Photo Record Process

Once manual photo is triggered via APIM, APIM shall input below msg:

* *HMI Command == Photo Capture*

Then IDCM receives the command, and responses below msg:

* *DVR Command Response == Photo Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*

Once photo capture complete, IDCM shall send out command result:

* *DVR Command Response == Photo Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*

If photo capture failed, IDCM shall also output the failure reason via *DVR Command Failed Reason* msg.

###### Screenshot Process

When video replay ongoing, customer could trigger screenshot, APIM shall input below msg:

* *HMI Command == Video Screenshot*

Then IDCM receives the command, and responses below msg:

* *DVR Command Response == Video Screenshot*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*

Once photo capture complete, IDCM shall send out command result:

* *DVR Command Response == Video Screenshot*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*

If screenshot failed, IDCM shall also output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Photo Record Attributes

Photos should be saved into eMMC “Key Data” folder, naming rule: PHO-<Year-Month-Day Hour-Minute-Second>.jpg

#### Technology Function Manual Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Manual\_Video\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Manual\_Video\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Manual\_Video\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Video\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Recording\_Timestamp | Video Recording Timer | **UART msg**: IDCM\_ProgressSync\_Enum [Type:0x02] [Subtype:0x02]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Manual Video Record Start Process

Once manual video start is triggered, APIM shall input below msg:

* *HMI Command == Video Capture*

Once IDCM receives the command, IDCM should start to manual video record, also synchronize the recording timestamp to APIM every 500ms:

* *DVR Command Response == Video Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*
* *Video Record Status == Manual Recording*
* *Video Recording Timer == “Corresponding recording timestamp”*

Once video capture complete, IDCM should send out command result:

* *DVR Command Response == Video Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*
* *Video Record Status == “last available value”*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Video Record Stop Process

Once manual video stop is triggered, APIM shall input below msg:

* *HMI Command ==* *Stop Video Capture*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Stop Video Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Record Status == Manual Recording*

Once video recording stopped, IDCM shall send out command result:

* *DVR Command Response == Stop Video Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Record Status == “last available value”*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Video Record Attributes

Manual video should be saved into eMMC “Key Data” folder, naming rule: MAN-<Year-Month-Day Hour-Minute-Second>.mp4.

#### Technology Function Video Watermark

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Veh\_Speed | Vehicle Speed | **UART msg**: APIM\_VehicleSpeed\_Int [Type:0x12] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Veh\_VIN | Vehicle VIN number | **UART msg**: APIM\_VIN\_ASCII [Type:0x12] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| Veh\_Gear | Vehicle Gear Position | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Veh\_Corenering\_Lamp | Cluster Cornering Lamp Status | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #2 | NA. | NA. |
| Veh\_Seatbelt | Cluster Seatbelt Lamp Status | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #3 | NA. | NA. |
| GPS\_Year | Year Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| GPS\_Month | Month Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| GPS\_Day | Day Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| GPS\_Hour | Hour Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
| GPS\_Min | Minute Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
| GPS\_Second | Second Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #6 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Video Watermark Attributes

IDCM shall save the input data list in this section and label them onto normal and emergency video, the latency between data input and label onto video should less than 100ms.

#### Technology Function Video Liveview

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Liveview\_Page\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Video Liveview

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Enter\_Liveview\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Enter\_Liveview\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Enter\_Liveview\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Video Liveview

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Video Liveview Process

Once enter DVR Liveview page (main page) is triggered, APIM shall input below msg:

* *HMI Command == Enter Live View Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Live View Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to liveview, IDCM should feedback below command result:

* *DVR Command Response == Enter Live View Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Liveview Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

#### Technology Function Playback List Display

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Playback\_List\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback List Display

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Playback\_List\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Playback\_List\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Playback\_List\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Currently\_Storage\_Location | Currently Storage Location | **UART msg**: IDCM\_BrowseLocation\_Int [Type:0x03] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Currently\_File\_Number | Total File Number | **UART msg**: IDCM\_BrowseLocation\_Int [Type:0x03] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |

Table 5‑3: Output Signal mappings of Function Playback List Display

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Data Playback List Display Process

Once normal data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback Normal Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback Normal Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to normal data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback Normal Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Normal Video List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Key Data Playback List Display Process

Once key data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback Key Data Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback Key Data Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to key data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback Key Data Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Key Data List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Data Playback List Display Process

Once TF data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback TF Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback TF Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to TF data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback TF Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == TF Card List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Playback List Empty Display

After enter one of the playback list, IDCM shall update the file list status to APIM:

* *Currently Storage Location == “the displayed file location EMMC or TF”*
* *Total File Number == “Corresponding file number in currently file location”*

If file number is 0, APIM shall give reminder to customer.

###### Playback List Display Attributes

* Normal data playback list page should only contain normal video.
* Key data playback list page should contain manual photo / manual video or emergency video, and there should be a label to distinguish video type.
* TF data playback list will only contain data copy from Normal data or Key data folder.
* All above data should be sorted by time in reverse order.
* Playback list should update automatically if new data created.

###### Playback List Scroll Process

When customer try to scroll up or down playback list, APIM shall send below msg to IDCM:

* *HMI Command == Scroll to Previous Page or Scroll to Next Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Scroll to Previous Page or Scroll to Next Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After list scroll complete, IDCM should feedback below command result:

* *DVR Command Response == Scroll to Previous Page or Scroll to Next Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Playback List Display Attributes

* Normal data playback list page should only contain normal video.
* Key data playback list page should contain manual photo / manual video or emergency video, and there should be a label to distinguish video type.
* TF data playback list will only contain data copy from Normal data or Key data folder.
* All above data should be sorted by time in reverse order.
* Playback list should update automatically if new data created.

#### Technology Function Data Playback Control

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Playback\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| X-Axis\_Coordinate | X-Axis Coordinate | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
| Y-Axis\_Coordinate | Y-Axis Coordinate | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback Control

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Playback\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Playback\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Playback\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Playback Control

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### File selected to Play Process

When one of the files in playback list is selected, APIM shall input below msg:

* *HMI Command == Play Selected File*
* *X-Axis Coordinate == “X-Axis Coordinate of finger touch on APIM screen”*
* *Y-Axis Coordinate == “Y-Axis Coordinate of finger touch on APIM screen”*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Play Selected File*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After file replay is ready, IDCM should feedback below command result:

* *DVR Command Response == Play Selected File*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start or Pause Video Playback Process

When start or pause video play is triggered, APIM shall input below msg:

* *HMI Command == Start Video Play or Pause Video Play*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Start Video Play or Pause Video Play*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

After start or pause action complete, IDCM should feedback below command result:

* *DVR Command Response == Start Video Play or Pause Video Play*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Play Last or Next Data Process

When change to play last or next file is triggered, APIM shall input below msg:

* *HMI Command == Play Last File or Play Next File*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Play Last File or Play Next File*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

After data switch action complete, IDCM should feedback below command result:

* *DVR Command Response == Play Last File or Play Next File*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Video Forward or Backward Process

**Finger starts to touch the screen:**

1. When video replay ongoing, if customer slides finger across the screen, APIM shall send below messages:

* *HMI Command == Finger Touch Start*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, should start to show timestamp and response below msg:

* *DVR Command Response == Finger Touch Start*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

**Finger Sliding:**

1. During finger sliding, APIM should send below message to IDCM every 100ms:

* *HMI Command == Finger Touch Continue*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, should update timestamp and response below msg:

* *DVR Command Response == Finger Touch Continue*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

**Finger leaves the screen:**

1. When finger leaves the screen, APIM shall send below messages to IDCM:

* *HMI Command == Finger Touch End*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, IDCM should update timestamp and relocate video playing , and response below msg:

* *DVR Command Response == Finger Touch End*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Data Playback Display Attributes

* Playback only will happen when gear position is P.
* When launched to playback page, video should start to play automatically.
* Watermark information should be displayed on normal or emergency video.

#### Technology Function DVR Parameter Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Normal\_Video\_Switch | Normal Video Record Switch | **UART msg**: APIM\_NormalVideoSwitch\_Enum [Type:0x15] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Vehicle\_Monitor\_Switch | Vehicle Monitor Function Switch | **UART msg**: APIM\_VehicleMonitorSwitch\_Enum [Type:0x15] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Emergency\_Video\_Duration | Emergency Video Duration | **UART msg**: APIM\_SetEmergencyDuration\_Enum [Type:0x15] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| G-Sensor Sensitive | G-Sensor Collide Sensitive | **UART msg**: APIM\_SetCollideSensitive\_Enum [Type:0x15] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR Parameter Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Normal\_Video\_Switch\_Rsp | Normal Video Switch Response | **UART msg**: IDCM\_NormalVideoSwitch\_Enum [Type:0x04] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Vehicle\_Monitor\_Switch\_Rsp | Vehicle Monitor Switch Response | **UART msg**: IDCM\_VehicleMonitorSwitch\_Enum [Type:0x04] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Emergency\_Video\_Duration\_Rsp | Emergency Video Duration Response | **UART msg**: IDCM\_SetEmergencyDuration\_Enum [Type:0x04] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| Gsensor\_Sensitive\_Rsp | Collision Detection Sensitive Level | **UART msg**: IDCM\_SetCollideSensitive\_Enum [Type:0x04] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Setting\_Reset\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Normal\_Record\_Enable\_Status | Normal Video Record Enable Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR Parameter Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Video Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Normal Video Record Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Normal Video Switch Response == “New setting value”*
* *Normal Video Record Enable Status == Enabled or Disabled*

###### Vehicle Monitor Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Vehicle Monitor Function Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Vehicle Monitor Switch Response == “New setting value”*

###### Emergency Video Duration Setting Process

Once setting value is changed, APIM shall input below msg:

* *Emergency Video Duration == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Emergency Video Duration Response == “New setting value”*

###### Collision Detection Sensitive Setting Process

Once setting value is changed, APIM shall input below msg:

* *G-Sensor Collide Sensitive == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Collision Detection Sensitive Level == “New setting value”*

###### Setting Value Reset Process

When setting reset is triggered, APIM shall input below msg:

* *HMI Command == Setting Reset to Default*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Setting Reset to Default*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After setting value reset complete, IDCM should feedback below command result:

* *DVR Command Response == Setting Reset to Default*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### DVR Parameter Setting Attributes

* If input setting value is invalid, IDCM shall *feedback “Invalid Value”* to APIM.
* If setting value update failed, IDCM shall feedback error status to APIM.

#### Technology Function DVR Wi-Fi Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| WIFI\_Hotspot\_Switch | Wi-Fi Hotspot Switch | **UART msg**: APIM\_WiFiHotspotSwitch\_Enum [Type:0x15] [Subtype:0x05]  **Data ID**: #1 | NA. | NA. |
| WIFI\_SSID\_Setting | DVR Wi-Fi SSID | **UART msg**: APIM\_SetWiFiSSID\_Enum [Type:0x15] [Subtype:0x06]  **Data ID**: #1 | NA. | NA. |
| WIFI\_PWD\_Setting | DVR Wi-Fi Password | **UART msg**: APIM\_SetEmergencyDuration\_Enum [Type:0x15] [Subtype:0x07]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR Wi-Fi Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| WIFI\_Hotspot\_Switch\_Rsp | Wi-Fi Hotspot Switch Response | **UART msg**: IDCM\_WiFiHotspotSwitch\_Enum [Type:0x05] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| WIFI\_SSID\_Setting\_ Rsp | DVR Wi-Fi SSID Response | **UART msg**: IDCM\_SetWiFiSSID\_Enum [Type:0x05] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| WIFI\_PWD\_Setting\_Rsp | DVR Wi-Fi Password Response | **UART msg**: IDCM\_SetWiFiPSWD\_Enum [Type:0x05] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| WIFI\_Connect\_Status | DVR Wi-Fi Connection Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #6 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR Wi-Fi Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### DVR Wi-Fi Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Wi-Fi Hotspot Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Wi-Fi Hotspot Switch Response == “New setting value”*

###### DVR Wi-Fi SSID Setting Process

Once setting value is changed, APIM shall input below msg:

* *DVR Wi-Fi SSID == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *DVR Wi-Fi SSID Response == “New setting value”*

###### DVR Wi-Fi Password Setting Process

Once setting value is changed, APIM shall input below msg:

* *DVR Wi-Fi Password == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *DVR Wi-Fi Password Response == “New setting value”*

###### DVR Wi-Fi Connection Update Process

Once setting value is changed, IDCM shall update Wi-Fi connection status to APIM via heartbeat msg:

* *DVR Wi-Fi Connection Status == “Corresponding Wi-Fi connection status”*

###### DVR Wi-Fi Setting Attributes

* If input setting value is invalid, IDCM shall *feedback “Invalid Value”* to APIM.
* If setting value update failed, IDCM shall feedback error status to APIM.

#### Technology Function DVR System Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| DVR\_SYSSetting\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR System Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| DVR\_SYSSetting\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| DVR\_SYSSetting\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| DVR\_SYSSetting\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| IDCM\_SW\_Version | IDCM SW Version | **UART msg**: IDCM\_UpgradeStatus\_Enum [Type:0x06] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| EMMC\_Storage | IDCM eMMC Storage | **UART msg**: IDCM\_StorageStatus\_Int [Type:0x06] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| TF\_Storage | IDCM TF Card Storage | **UART msg**: IDCM\_StorageStatus\_Int [Type:0x06] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR System Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### DVR System Information Update Process

When enter DVR system setting page, APIM shall input below msg:

* *HMI Command == Enter System Setting Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter System Setting Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

Then IDCM should feedback system information to APIM:

* *IDCM SW Version == “Corresponding IDCM SW version”*
* *IDCM eMMC Storage == “Corresponding storage percent”*
* *IDCM TF Card Storage == “Corresponding storage percent”*

###### Format TF Card Process

When format TF card is triggered, APIM shall input below msg:

* *HMI Command == Format TF Card*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Format TF Card*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After format complete, IDCM should feedback below command result:

* *DVR Command Response == Format TF Card*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

#### Technology Function Data Copy to TF

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Copy\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| File\_ID | File X Value | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #2 |  |  |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Data Copy to TF

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Copy\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Copy\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Copy\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| File\_Copy\_Number | Total File Number | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Current\_Copy\_ID | Current File ID | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
| Copy\_Progress | Data Operation Progress | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #3 | NA. | NA. |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
| Data\_Operation\_Status | Data Operation Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Data Copy to TF

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Smart Copy Process

1. When “smart copy” button is triggered on APIM DVR main page, APIM shall input below msg:

* *HMI Command == Smart Copy*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == Smart Copy*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to copy the newest two normal videos from local memory to TF card, and update copy status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to copy”*
* *Current File ID == “Corresponding file ID under copy”*
* *Data Operation Progress == “Corresponding copy progress percent”*
* *Data Operation Status == Data Copy Ongoing*

1. Once copy complete, IDCM shall response below msg:

* *DVR Command Response == Smart Copy*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Copy List Creation Process

When file is checked or uncheck in normal data list or key data list, APIM shall input below msg:

* *HMI Command == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Select All File*

*Or*

*HMI Command == Unselect All File*

Once IDCM receives the command, should update the file chosen list and label the chosen files in output video stream, then response below msg:

* *DVR Command Response == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Select All File*

*Or*

*DVR Command Response == Unselect All File*

* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start Copy Process

1. When “copy” button is triggered, APIM shall input below msg:

* *HMI Command == TF Card Copy*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == TF Card Copy*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to copy the chosen files from local memory to TF card, and update copy status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to copy”*
* *Current File ID == “Corresponding file ID under copy”*
* *Data Operation Progress == “Corresponding copy progress percent”*
* *Data Operation Status == Data Copy Ongoing*

1. Once copy complete, IDCM shall response below msg:

* *DVR Command Response == TF Card Copy*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Stop Copy Process

When “copy cancellation” is triggered, APIM shall input below msg:

* *HMI Command == TF Card Copy Stop*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == TF Card Copy Stop*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Data Copy Ongoing*

After copy progress is stopped, IDCM should feedback below command result:

* *DVR Command Response == TF Card Copy Stop*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Card Abnormal Status Detection Process

* If TF card is empty, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Empty*
* If no TF card available, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Pull Out*
* If need to format TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Need Format*
* If no enough space to copy in TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Full*

Once APIM receive above status and data copy is triggered, APIM shall ask for user permission to continue copy operation and send corresponding command to IDCM.

###### Data Copy Attributes

* If customer moves to other the data storage folder on APIM HMI, the file chosen list should be cleared.

#### Technology Function Data Deletion from TF

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Delete\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| File\_ID | File X Value | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #2 |  |  |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Data Deletion from TF

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Delete\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Delete\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Delete\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| File\_Delete\_Number | Total File Number | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Current\_Delete\_ID | Current File ID | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
| Delete\_Progress | Data Operation Progress | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #3 | NA. | NA. |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
| Data\_Operation\_Status | Data Operation Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Data Deletion from TF

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Delete List Creation Process

When file is checked or uncheck in TF data list, APIM shall input below msg:

* *HMI Command == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Select All File*

*Or*

*HMI Command == Unselect All File*

Once IDCM receives the command, should update the file chosen list and label the chosen files in output video stream, then response below msg:

* *DVR Command Response == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Select All File*

*Or*

*DVR Command Response == Unselect All File*

* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start Deletion Process

1. When “delete” button is triggered, APIM shall input below msg:

* *HMI Command == TF Card Delete*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == TF Card Delete*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to delete the chosen files from TF card, and update deletion status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to delete”*
* *Current File ID == “Corresponding file ID under deletion”*
* *Data Operation Progress == “Corresponding deletion progress percent”*
* *Data Operation Status == Data Deletion Ongoing*

1. Once deletion complete, IDCM shall response below msg:

* *DVR Command Response == TF Card Delete*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Stop Deletion Process

When “delete cancellation” is triggered, APIM shall input below msg:

* *HMI Command == TF Card Delete Stop*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == TF Card Delete Stop*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Data Deletion Ongoing*

After deletion progress is stopped, IDCM should feedback below command result:

* *DVR Command Response == TF Card Delete Stop*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Card Abnormal Status Detection Process

* If any TF error happening, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Error*
* If need to format TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Need Format*

Once APIM receive above status and data deletion is triggered, APIM shall ask for user permission to continue delete operation and send corresponding command to IDCM.

###### Data Deletion Attributes

* If customer moves to other the data storage folder on APIM HMI, the file chosen list should be cleared.

#### Technology Function Vehicle Monitor

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback List Display

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Vehicle\_Monitor\_Video\_Number | Vehicle Emergency Video Number | **UART msg**: IDCM\_VehicleMonitor\_Int [Type:0x02] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Vehicle Monitor

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Collision Detection Requirement

* DVR user could disable vehicle monitor function via DVR setting.
* When IDCM is in standby power mode and vehicle monitor function is enabled, it should keep monitor the vehicle status via G-Sensor detection, if collision happening, IDCM should wakeup itself to take an emergency video, after video capture complete, IDCM should go back to standby mode until Ignition on.
* As PAAT module, IDCM should be able to support vehicle monitor for 5 days.
* The video duration should be same as emergency video (default 30s) and configurable via DVR setting
* The max video number that could be captured in one ignition off cycle is 10.
* All vehicle monitor emergency video should be save into IDCM local memory key folder and follow same emergency video naming rule.

###### Ignition On Reminder Process

When ignition on, if emergency video captured during last ignition off cycle, IDCM should update the video number to APIM via below msg:

* *Vehicle Emergency Video Number == “Corresponding video number”*

#### Technology Function TF Card Detection

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function TF Card Detection

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function TF Card Detection

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### TF Card Insert Reminder Process

When TF Card is insert, IDCM should update the status to APIM via below msg:

* *TF Card Status == TF Insert*

### APIM – DVROnboardClient

#### Technology Function Normal Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Normal\_Record\_Setting | Normal Video Record Switch | **UART msg**: APIM\_NormalVideoSwitch\_Enum [Type:0x15] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Normal Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Normal Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Video Record Process

IDCM should start normal video record base on below inputs:

* *DVR system self-test is ok*
* *Normal video is Enabled (Normal Video Record Switch == Normal Video Enabled)*

Once above condition is met, IDCM should start to normal recording, and output below msg:

* *Video Record Status == Normal Recording*

After record complete, IDCM should set *Video Record Status back to last available value.*

###### Emergency Video Record Attributes

According to GB/T 38892, all normal video must be saved into eMMC without modification. The default normal video duration is 3 minutes and should be saved into eMMC “Normal Data” folder.

Naming rule: NOR-<Year-Month-Day Hour-Minute-Second>.mp4.

#### Technology Function Emergency Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Veh\_Speed | Vehicle Speed | **UART msg**: APIM\_VehicleSpeed\_Int [Type:0x12] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Veh\_Brake\_Status | Vehicle Brake Pedal Status | **UART msg**: APIM\_Brake\_Enum [Type:0x12] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Emergency Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Recording\_Timestamp | Video Recording Timer | **UART msg**: IDCM\_ProgressSync\_Enum [Type:0x02] [Subtype:0x02]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Emergency Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Emergency Video Record Process

IDCM should has the ability to detect the vehicle collision base on below inputs:

* *Internal G-Sensor detection*
* *Vehicle Speed*
* *Vehicle Brake Pedal Status == Driver\_Braking*

Once trigger condition is met, IDCM should start to emergency record, also synchronize the recording timestamp to APIM every 500ms:

* *Video Record Status == Emergency Recording*
* *Video Recording Timer == “Corresponding recording timestamp”*

After recording complete, IDCM should set *Video Record Status back to last available value.*

###### Emergency Video Record Attributes

If normal video record is enabled, video duration should contain 15 seconds before trigger event and 30 seconds after trigger event. If normal video record is disabled, emergency video should only contain 30 seconds after collision detected. The “30 seconds” is configurable through DVR setting page on APIM. Emergency video should be saved into eMMC “Key Data” folder.

Video naming rule: EVT-<Year-Month-Day Hour-Minute-Second>.mp4

###### Other Video Record Inhibition

Emergency video record shall not impact normal video recording, and will interrupt manual video or photo record.

#### Technology Function Manual Photo Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Manual\_Photo\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Photo Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Manual\_Photo\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Manual\_Photo\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Photo\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Photo Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Manual Photo Record Process

Once manual photo is triggered via APIM, APIM shall input below msg:

* *HMI Command == Photo Capture*

Then IDCM receives the command, and responses below msg:

* *DVR Command Response == Photo Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*

Once photo capture complete, IDCM shall send out command result:

* *DVR Command Response == Photo Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*

If photo capture failed, IDCM shall also output the failure reason via *DVR Command Failed Reason* msg.

###### Screenshot Process

When video replay ongoing, customer could trigger screenshot, APIM shall input below msg:

* *HMI Command == Video Screenshot*

Then IDCM receives the command, and responses below msg:

* *DVR Command Response == Video Screenshot*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*

Once photo capture complete, IDCM shall send out command result:

* *DVR Command Response == Video Screenshot*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*

If screenshot failed, IDCM shall also output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Photo Record Attributes

Photos should be saved into eMMC “Key Data” folder, naming rule: PHO-<Year-Month-Day Hour-Minute-Second>.jpg

#### Technology Function Manual Video Record

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Manual\_Video\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Manual\_Video\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Manual\_Video\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Video\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Record\_Status | Video Record Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Recording\_Timestamp | Video Recording Timer | **UART msg**: IDCM\_ProgressSync\_Enum [Type:0x02] [Subtype:0x02]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Manual Video Record Start Process

Once manual video start is triggered, APIM shall input below msg:

* *HMI Command == Video Capture*

Once IDCM receives the command, IDCM should start to manual video record, also synchronize the recording timestamp to APIM every 500ms:

* *DVR Command Response == Video Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason = Reserved*
* *Video Record Status == Manual Recording*
* *Video Recording Timer == “Corresponding recording timestamp”*

Once video capture complete, IDCM should send out command result:

* *DVR Command Response == Video Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason = Reserved*
* *Video Record Status == “last available value”*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Video Record Stop Process

Once manual video stop is triggered, APIM shall input below msg:

* *HMI Command == Stop Video Capture*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Stop Video Capture*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Record Status == Manual Recording*

Once video recording stopped, IDCM shall send out command result:

* *DVR Command Response == Stop Video Capture*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Record Status == “last available value”*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Manual Video Record Attributes

Manual video should be saved into eMMC “Key Data” folder, naming rule: MAN-<Year-Month-Day Hour-Minute-Second>.mp4.

#### Technology Function Video Watermark

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Veh\_Speed | Vehicle Speed | **UART msg**: APIM\_VehicleSpeed\_Int [Type:0x12] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Veh\_VIN | Vehicle VIN number | **UART msg**: APIM\_VIN\_ASCII [Type:0x12] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| Veh\_Gear | Vehicle Gear Position | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Veh\_Corenering\_Lamp | Cluster Cornering Lamp Status | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #2 | NA. | NA. |
| Veh\_Seatbelt | Cluster Seatbelt Lamp Status | **UART msg**: APIM\_Watermark\_Enum [Type:0x12] [Subtype:0x04]  **Data ID**: #3 | NA. | NA. |
| GPS\_Year | Year Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| GPS\_Month | Month Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| GPS\_Day | Day Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| GPS\_Hour | Hour Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
| GPS\_Min | Minute Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
| GPS\_Second | Second Data | **UART msg**: APIM\_GPSDateTime\_Int [Type:0x13] [Subtype:0x01]  **Data ID**: #6 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Manual Video Record

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Manual Video Record

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Video Watermark Attributes

IDCM shall save the input data list in this section and label them onto normal and emergency video, the latency between data input and label onto video should less than 100ms.

#### Technology Function Video Liveview

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Liveview\_Page\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Video Liveview

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Enter\_Liveview\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Enter\_Liveview\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Enter\_Liveview\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Video Liveview

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Video Liveview Process

Once enter DVR Liveview page (main page) is triggered, APIM shall input below msg:

* *HMI Command == Enter Live View Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Live View Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to liveview, IDCM should feedback below command result:

* *DVR Command Response == Enter Live View Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Liveview Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

#### Technology Function Playback List Display

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Playback\_List\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback List Display

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Playback\_List\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Playback\_List\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Playback\_List\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Playback List Display

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Data Playback List Display Process

Once normal data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback Normal Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback Normal Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to normal data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback Normal Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Normal Video List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Key Data Playback List Display Process

Once key data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback Key Data Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback Key Data Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to key data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback Key Data Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Key Data List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Data Playback List Display Process

Once TF data playback list is triggered, APIM shall input below msg:

* *HMI Command == Enter Playback TF Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter Playback TF Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After switch to TF data playback list page, IDCM should feedback below command result:

* *DVR Command Response == Enter Playback TF Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == TF Card List Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Playback List Scroll Process

When customer try to scroll up or down playback list, APIM shall send below msg to IDCM:

* *HMI Command == Scroll to Previous Page or Scroll to Next Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Scroll to Previous Page or Scroll to Next Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After list scroll complete, IDCM should feedback below command result:

* *DVR Command Response == Scroll to Previous Page or Scroll to Next Page*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Playback List Display Attributes

* Normal data playback list page should only contain normal video.
* Key data playback list page should contain manual photo / manual video or emergency video, and there should be a label to distinguish video type.
* TF data playback list will only contain data copy from Normal data or Key data folder.
* All above data should be sorted by time in reverse order.
* Playback list should update automatically if new data created.

#### Technology Function Data Playback Control

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Playback\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| X-Axis\_Coordinate | X-Axis Coordinate | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
| Y-Axis\_Coordinate | Y-Axis Coordinate | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback Control

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Playback\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Playback\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Playback\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Video\_Output\_Page | Video Output Page | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Playback Control

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### File selected to Play Process

When one of the files in playback list is selected, APIM shall input below msg:

* *HMI Command == Play Selected File*
* *X-Axis Coordinate == “X-Axis Coordinate of finger touch on APIM screen”*
* *Y-Axis Coordinate == “Y-Axis Coordinate of finger touch on APIM screen”*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Play Selected File*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == “last available value”*

After file replay is ready, IDCM should feedback below command result:

* *DVR Command Response == Play Selected File*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start or Pause Video Playback Process

When start or pause video play is triggered, APIM shall input below msg:

* *HMI Command == Start Video Play or Pause Video Play*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Start Video Play or Pause Video Play*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

After start or pause action complete, IDCM should feedback below command result:

* *DVR Command Response == Start Video Play or Pause Video Play*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Play Last or Next Data Process

When change to play last or next file is triggered, APIM shall input below msg:

* *HMI Command == Play Last File or Play Next File*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Play Last File or Play Next File*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

After data switch action complete, IDCM should feedback below command result:

* *DVR Command Response == Play Last File or Play Next File*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Video Forward or Backward Process

**Finger starts to touch the screen:**

1. When video replay ongoing, if customer slides finger across the screen, APIM shall send below messages:

* *HMI Command == Finger Touch Start*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, should start to show timestamp and response below msg:

* *DVR Command Response == Finger Touch Start*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

**Finger Sliding:**

1. During finger sliding, APIM should send below message to IDCM every 100ms:

* *HMI Command == Finger Touch Continue*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, should update timestamp and response below msg:

* *DVR Command Response == Finger Touch Continue*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

**Finger leaves the screen:**

1. When finger leaves the screen, APIM shall send below messages to IDCM:

* *HMI Command == Finger Touch End*
* *X-Axis Coordinate == “Finger X Coordinate”*
* *Y-Axis Coordinate == “Finger Y Coordinate”*

1. Once IDCM receives the command, IDCM should update timestamp and relocate video playing , and response below msg:

* *DVR Command Response == Finger Touch End*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Video Output Page == Data Playing Page*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Data Playback Display Attributes

* Playback only will happen when gear position is P.
* When launched to playback page, video should start to play automatically.
* Watermark information should be displayed on normal or emergency video.

#### Technology Function DVR Parameter Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Normal\_Video\_Switch | Normal Video Record Switch | **UART msg**: APIM\_NormalVideoSwitch\_Enum [Type:0x15] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Vehicle\_Monitor\_Switch | Vehicle Monitor Function Switch | **UART msg**: APIM\_VehicleMonitorSwitch\_Enum [Type:0x15] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Emergency\_Video\_Duration | Emergency Video Duration | **UART msg**: APIM\_SetEmergencyDuration\_Enum [Type:0x15] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| G-Sensor Sensitive | G-Sensor Collide Sensitive | **UART msg**: APIM\_SetCollideSensitive\_Enum [Type:0x15] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR Parameter Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Normal\_Video\_Switch\_Rsp | Normal Video Switch Response | **UART msg**: IDCM\_NormalVideoSwitch\_Enum [Type:0x04] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Vehicle\_Monitor\_Switch\_Rsp | Vehicle Monitor Switch Response | **UART msg**: IDCM\_VehicleMonitorSwitch\_Enum [Type:0x04] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Emergency\_Video\_Duration\_Rsp | Emergency Video Duration Response | **UART msg**: IDCM\_SetEmergencyDuration\_Enum [Type:0x04] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| Gsensor\_Sensitive\_Rsp | Collision Detection Sensitive Level | **UART msg**: IDCM\_SetCollideSensitive\_Enum [Type:0x04] [Subtype:0x04]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Setting\_Reset\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Setting\_Reset\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| Normal\_Record\_Enable\_Status | Normal Video Record Enable Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #4 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR Parameter Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Normal Video Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Normal Video Record Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Normal Video Switch Response == “New setting value”*
* *Normal Video Record Enable Status == Enabled or Disabled*

###### Vehicle Monitor Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Vehicle Monitor Function Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Vehicle Monitor Switch Response == “New setting value”*

###### Emergency Video Duration Setting Process

Once setting value is changed, APIM shall input below msg:

* *Emergency Video Duration == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Emergency Video Duration Response == “New setting value”*

###### Collision Detection Sensitive Setting Process

Once setting value is changed, APIM shall input below msg:

* *G-Sensor Collide Sensitive == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Collision Detection Sensitive Level == “New setting value”*

###### Setting Value Reset Process

When setting reset is triggered, APIM shall input below msg:

* *HMI Command == Setting Reset to Default*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Setting Reset to Default*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After setting value reset complete, IDCM should feedback below command result:

* *DVR Command Response == Setting Reset to Default*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### DVR Parameter Setting Attributes

* If input setting value is invalid, IDCM shall *feedback “Invalid Value”* to APIM.
* If setting value update failed, IDCM shall feedback error status to APIM.

#### Technology Function DVR Wi-Fi Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| WIFI\_Hotspot\_Switch | Wi-Fi Hotspot Switch | **UART msg**: APIM\_WiFiHotspotSwitch\_Enum [Type:0x15] [Subtype:0x05]  **Data ID**: #1 | NA. | NA. |
| WIFI\_SSID\_Setting | DVR Wi-Fi SSID | **UART msg**: APIM\_SetWiFiSSID\_Enum [Type:0x15] [Subtype:0x06]  **Data ID**: #1 | NA. | NA. |
| WIFI\_PWD\_Setting | DVR Wi-Fi Password | **UART msg**: APIM\_SetEmergencyDuration\_Enum [Type:0x15] [Subtype:0x07]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR Wi-Fi Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| WIFI\_Hotspot\_Switch\_Rsp | Wi-Fi Hotspot Switch Response | **UART msg**: IDCM\_WiFiHotspotSwitch\_Enum [Type:0x05] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| WIFI\_SSID\_Setting\_ Rsp | DVR Wi-Fi SSID Response | **UART msg**: IDCM\_SetWiFiSSID\_Enum [Type:0x05] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| WIFI\_PWD\_Setting\_Rsp | DVR Wi-Fi Password Response | **UART msg**: IDCM\_SetWiFiPSWD\_Enum [Type:0x05] [Subtype:0x03]  **Data ID**: #1 | NA. | NA. |
| WIFI\_Connect\_Status | DVR Wi-Fi Connection Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #6 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR Wi-Fi Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### DVR Wi-Fi Switch Setting Process

Once setting value is changed, APIM shall input below msg:

* *Wi-Fi Hotspot Switch == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *Wi-Fi Hotspot Switch Response == “New setting value”*

###### DVR Wi-Fi SSID Setting Process

Once setting value is changed, APIM shall input below msg:

* *DVR Wi-Fi SSID == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *DVR Wi-Fi SSID Response == “New setting value”*

###### DVR Wi-Fi Password Setting Process

Once setting value is changed, APIM shall input below msg:

* *DVR Wi-Fi Password == “New setting value”*

Once IDCM completes setting update, should response below msg:

* *DVR Wi-Fi Password Response == “New setting value”*

###### DVR Wi-Fi Connection Update Process

Once setting value is changed, IDCM shall update Wi-Fi connection status to APIM via heartbeat msg:

* *DVR Wi-Fi Connection Status == “Corresponding Wi-Fi connection status”*

###### DVR Wi-Fi Setting Attributes

* If input setting value is invalid, IDCM shall *feedback “Invalid Value”* to APIM.
* If setting value update failed, IDCM shall feedback error status to APIM.

#### Technology Function DVR System Setting

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| DVR\_SYSSetting\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function DVR System Setting

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| DVR\_SYSSetting\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| DVR\_SYSSetting\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| DVR\_SYSSetting\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| IDCM\_SW\_Version | IDCM SW Version | **UART msg**: IDCM\_UpgradeStatus\_Enum [Type:0x06] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| EMMC\_Storage | IDCM eMMC Storage | **UART msg**: IDCM\_StorageStatus\_Int [Type:0x06] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| TF\_Storage | IDCM TF Card Storage | **UART msg**: IDCM\_StorageStatus\_Int [Type:0x06] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function DVR System Setting

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### DVR System Information Update Process

When enter DVR system setting page, APIM shall input below msg:

* *HMI Command == Enter System Setting Page*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Enter System Setting Page*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

Then IDCM should feedback system information to APIM:

* *IDCM SW Version == “Corresponding IDCM SW version”*
* *IDCM eMMC Storage == “Corresponding storage percent”*
* *IDCM TF Card Storage == “Corresponding storage percent”*

###### Format TF Card Process

When format TF card is triggered, APIM shall input below msg:

* *HMI Command == Format TF Card*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == Format TF Card*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

After format complete, IDCM should feedback below command result:

* *DVR Command Response == Format TF Card*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

#### Technology Function Data Copy to TF

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Copy\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| File\_ID | File X Value | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #2 |  |  |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Data Copy to TF

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Copy\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Copy\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Copy\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| File\_Copy\_Number | Total File Number | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Current\_Copy\_ID | Current File ID | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
| Copy\_Progress | Data Operation Progress | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #3 | NA. | NA. |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
| Data\_Operation\_Status | Data Operation Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Data Copy to TF

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Smart Copy Process

1. When “smart copy” button is triggered on APIM DVR main page, APIM shall input below msg:

* *HMI Command == Smart Copy*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == Smart Copy*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to copy the newest two normal videos from local memory to TF card, and update copy status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to copy”*
* *Current File ID == “Corresponding file ID under copy”*
* *Data Operation Progress == “Corresponding copy progress percent”*
* *Data Operation Status == Data Copy Ongoing*

1. Once copy complete, IDCM shall response below msg:

* *DVR Command Response == Smart Copy*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Copy List Creation Process

When file is checked or uncheck in normal data list or key data list, APIM shall input below msg:

* *HMI Command == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Select All File*

*Or*

*HMI Command == Unselect All File*

Once IDCM receives the command, should update the file chosen list and label the chosen files in output video stream, then response below msg:

* *DVR Command Response == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Select All File*

*Or*

*DVR Command Response == Unselect All File*

* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start Copy Process

1. When “copy” button is triggered, APIM shall input below msg:

* *HMI Command == TF Card Copy*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == TF Card Copy*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to copy the chosen files from local memory to TF card, and update copy status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to copy”*
* *Current File ID == “Corresponding file ID under copy”*
* *Data Operation Progress == “Corresponding copy progress percent”*
* *Data Operation Status == Data Copy Ongoing*

1. Once copy complete, IDCM shall response below msg:

* *DVR Command Response == TF Card Copy*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Stop Copy Process

When “copy cancellation” is triggered, APIM shall input below msg:

* *HMI Command == TF Card Copy Stop*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == TF Card Copy Stop*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Data Copy Ongoing*

After copy progress is stopped, IDCM should feedback below command result:

* *DVR Command Response == TF Card Copy Stop*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Card Abnormal Status Detection Process

* If TF card is empty, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Empty*
* If no TF card available, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Pull Out*
* If need to format TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Need Format*
* If no enough space to copy in TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Full*

Once APIM receive above status and data copy is triggered, APIM shall ask for user permission to continue copy operation and send corresponding command to IDCM.

###### Data Copy Attributes

* If customer moves to other the data storage folder on APIM HMI, the file chosen list should be cleared.

#### Technology Function Data Deletion from TF

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Data\_Delete\_Cmd | HMI Command | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| File\_ID | File X Value | **UART msg**: APIM\_HMICommand\_Enum [Type:0x14] [Subtype:0x01]  **Data ID**: #2 |  |  |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Data Deletion from TF

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Data\_Delete\_Rsp | DVR Command Response | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #1 | NA. | NA. |
| Data\_Delete\_Rst | DVR Command Result | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #2 | NA. | NA. |
| Data\_Delete\_Fail\_Reason | DVR Command Failed Reason | **UART msg**: IDCM\_CommandRsp\_Enum [Type:0x02] [Subtype:0x01]  **Data ID**: #3 | NA. | NA. |
| File\_Delete\_Number | Total File Number | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #1 | NA. | NA. |
| Current\_Delete\_ID | Current File ID | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #2 | NA. | NA. |
| Delete\_Progress | Data Operation Progress | **UART msg**: IDCM\_ProgressSync\_Int[Type:0x02] [Subtype:0x02]  **Data ID**: #3 | NA. | NA. |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
| Data\_Operation\_Status | Data Operation Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #5 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Data Deletion from TF

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Delete List Creation Process

When file is checked or uncheck in TF data list, APIM shall input below msg:

* *HMI Command == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*HMI Command == Select All File*

*Or*

*HMI Command == Unselect All File*

Once IDCM receives the command, should update the file chosen list and label the chosen files in output video stream, then response below msg:

* *DVR Command Response == Selected File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Unselect File X && File X Value == “Corresponding File ID”*

*Or*

*DVR Command Response == Select All File*

*Or*

*DVR Command Response == Unselect All File*

* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### Start Deletion Process

1. When “delete” button is triggered, APIM shall input below msg:

* *HMI Command == TF Card Delete*

1. Once IDCM receives the command, shall response below msg:

* *DVR Command Response == TF Card Delete*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*

1. IDCM should start to delete the chosen files from TF card, and update deletion status to APIM every 500ms:

* *Total File Number == “Corresponding total files number to delete”*
* *Current File ID == “Corresponding file ID under deletion”*
* *Data Operation Progress == “Corresponding deletion progress percent”*
* *Data Operation Status == Data Deletion Ongoing*

1. Once deletion complete, IDCM shall response below msg:

* *DVR Command Response == TF Card Delete*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via DVR Command Failed Reason msg.

###### Stop Deletion Process

When “delete cancellation” is triggered, APIM shall input below msg:

* *HMI Command == TF Card Delete Stop*

Once IDCM receives the command, and responses below msg:

* *DVR Command Response == TF Card Delete Stop*
* *DVR Command Result == Command Reception Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Data Deletion Ongoing*

After deletion progress is stopped, IDCM should feedback below command result:

* *DVR Command Response == TF Card Delete Stop*
* *DVR Command Result == Execution Succeed*
* *DVR Command Failed Reason == Reserved*
* *Data Operation Status == Reserved*

If execution failed, IDCM shall output the failure reason via *DVR Command Failed Reason* msg.

###### TF Card Abnormal Status Detection Process

* If any TF error happening, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Error*
* If need to format TF card, IDCM shall update TF status to APIM in heartbeat msg:
* *TF Card Status == TF Need Format*

Once APIM receive above status and data deletion is triggered, APIM shall ask for user permission to continue delete operation and send corresponding command to IDCM.

###### Data Deletion Attributes

* If customer moves to other the data storage folder on APIM HMI, the file chosen list should be cleared.

#### Technology Function Vehicle Monitor

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function Playback List Display

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| Vehicle\_Monitor\_Video\_Number | Vehicle Emergency Video Number | UART msg: IDCM\_VehicleMonitor\_Int [Type:0x02] [Subtype:0x03]  Data ID: #1 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function Vehicle Monitor

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### Collision Detection Requirement

* DVR user could disable vehicle monitor function via DVR setting.
* When IDCM is in standby power mode and vehicle monitor function is enabled, it should keep monitor the vehicle status via G-Sensor detection, if collision happening, IDCM should wakeup itself to take an emergency video, after video capture complete, IDCM should go back to standby mode until Ignition on.
* As PAAT module, IDCM should be able to support vehicle monitor for 5 days.
* The video duration should be same as emergency video (default 30s) and configurable via DVR setting
* The max video number that could be captured in one ignition off cycle is 10.
* All vehicle monitor emergency video should be save into IDCM local memory key folder and follow same emergency video naming rule.

###### Ignition On Reminder Process

When ignition on, if emergency video captured during last ignition off cycle, IDCM should update the video number to APIM via below msg:

* *Vehicle Emergency Video Number == “Corresponding video number”*

#### Technology Function TF Card Detection

##### Function Interfaces

###### Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| NA. | NA. | NA. | NA. | NA. |
|  |  |  |  |  |

Table 5‑2: Input Signal mappings of Function TF Card Detection

###### Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Signal Name** | **Technical Signal Name** | **Mapping Details**  *(Conditional)* | **Publisher Interface** | **Connection**  *(Optional)* |
| TF\_Card\_Status | TF Card Status | **UART msg**: IDCM\_Heartbeat\_Enum [Type:0x01] [Subtype:0x01]  **Data ID**: #9 | NA. | NA. |
|  |  |  |  |  |

Table 5‑3: Output Signal mappings of Function TF Card Detection

###### Parameters

NA.

###### Interface Requirements

Refer to DVR UART protocol.

##### Function Requirements

###### TF Card Insert Reminder Process

When TF Card is insert, IDCM should update the status to APIM via below msg:

* *TF Card Status == TF Insert*

### APP – DVROffboardClient

#### Technology Function Video Liveview

#### Technology Function Data Playback

#### Technology Function Data Copy to Smartphone

## Requirements on Connections

### Networks

#### “CAN Bus xxx”

***NA.***

##### Protocol Requirements

**NA.**

##### Electrical Requirements

**NA.**

#### “LIN Bus xxx”

**NA.**

##### Protocol Requirements

###### Schedule Table

***NA.***

##### Electrical Requirements

***NA.***

#### “Ethernet xxx”

***NA.***

### HW I/Os

POC interface over FPD-Link will support DVR(IDCM) power management, the detail pin definition should follow APIM HW design.

#### “HW I/O xxx”

## Requirements on Development Process

# Open Concerns

| ID | Concern Description | e-Tracker Reference | Status | Solution |
| --- | --- | --- | --- | --- |
| 1 | How to support IDCM diagnostic? What event should be record via APIM diagnostic? |  | Open | TBD |
| 2 | How to support IDCM SWDL via APIM? Will need to support OTA via APIM? |  | Open | TBD |
| 3 | How to support DVR data analytics? What event should be record? |  | Open | TBD |
| 4 |  |  |  |  |

Table 6‑1: Open Concerns

# Revision History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Revision | Date | Description | Approved by | Responsible |
| A |  | Initial version |  | YNIU6 |
|  |  |  |  |  |

## Template Revisions

*#Important: Do not change this section*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Version | Rev. | Date | Description | Responsible |
| 0 | 2 | 2015-08-05 | * TOC corrected * Document Properties adapted to match needs of VBA macros | Awegman1 |
| 1 | 0 | 2015-11-16 | * Revision History moved to chapter 7 * Table-Styles removed | Awegman1 |
| 1 | 1 | 2016-03-02 | * Rework according to PCL example | Jbaden1 |
| 1 | 2 | 2016-03-22 | * V1.3: Footer formating corrected (Issue 19) * “Constraints” chapter renamed to “Input Requirements” (Issue 20) | Jbaden1 |
| 1 | 3 | 2016-04-20 | * Broken Wiki links repaired | Jbaden1 |
| 2 | 0 | 2016-05-23 | * Prepared for Specification\_Macros.dotm v2.0 * Additional explanations added to ch. 2.2 “Input Requirements” (ARL and SDS requirements often go here) | Jbaden1 |
| 2 | 1 | 2016-07-08 | * Template version added to footer | Jbaden1 |
| 2 | 2 | 2016-07-15 | * Sample SysML diagrams added * Data Dictionary reworked * Alignment with relevant sections in SRD templated | Jbaden1 |
| 3 | 0 | 2016-09-05 | * Lessons learned from IPRB incorporated | Jbaden1 |
| 4 | 0 | 2016-09-27 | * Alignment with QPIP Feature Function Ownership workstream. Platform Spec renamed to Feature Implementation Spec | Jbaden1 |
| 4 | 1 | 2016-11-04 | * Chapters “Purpose” and “Scope” reworked. | Jbaden1 |
| 4 | 1 | 2016-11-10 | * Subsection for “Logical Service Interfaces” added. | Jbaden1 |
| 5 | 0 | 2017-01-13 | * Meta data updated for specification macros, version 3.1 * SW Unit chapter removed for the time being * Green boxes added for user hints | Jbaden1 |
| 5 | 1 | 2017-01-18 | * Minor editorial changes (e.g. hyperlinks highlighted in comments) | Jbaden1 |
| 5 | 1b | 2017-01-20 | * Some editorial corrections * Substructure of old Network Communication (now Connections) moved to Requirements on Connections | Jbaden1 |
| 6 | 0 | 2018-07-24 | * CR53: * Add new cover sheet * Add disclaimer section * Add the following meta-data to the doc properties for the the new cover sheet   + DocGis1ItemNumber   + DocGis2Classification   + DocType   + DocStatus   + DocIssueDate   + DocReleaseDate * CR63: Update FuSa sharepoint references in templates | Jbaden1 |
| 6 | 0 | 2018-08-06 | * CR81: Incorporate lessons learned from System Service Spec pilot (Vehicle Speed) into AFS and FIS | Jbaden1 |
| 6 | 0 | 2018-09-28 | * Broken links to RE Wiki repaired | Jbaden1 |
| 6 | 0 | 2018-10-31 | * Minor corrections on cover sheet and in footer to be more GIS compliant and VSEM aligned * “Overview” and “Description” exchanged in headings (following common sense) | Jbaden1 |
| 6 | 0 | 2018-11-30 | * Update of Functional Safety sections after review by Functional Safety Team * Initial support for variant handling | Jbaden1 |
| 6 | 0 | 2018-12-01 | * Variant condition fields added consistently * Links updated | Jbaden1 |
| 6 | 0 | 2018-12-11 | * Variant condition fields removed from mapping/allocation tables * Mapping tables simplified * Explanatory text for “Variants” sections revised | Jbaden1 |
| 6 | 0a | 2019-01-04 | * Chapter heading “Inherited Function Requirements” removed. Corresponding table renamed to “Requirements not cascaded”. * E/E Connection table got another column for allocated messages * Naming conventions for Implemented Functions corrected (FncName\_CmpName instead of FncName\_on\_CmpName) * Editorial corrections on the cover sheet * Explanatory text added to “Ethernet” section in chapter “Requirements on Connections” * AIS templates updated. Linked to Wiki page | Jbaden1 |
| 6 | 0a | 2019-01-04 | * Minor restructuring in FuSa chapter – after aligning with ECU Functional Spec * Bugfix: table 13 renamed from FTTI table to FHT table, includes a bug fix: each FSR is allocated to only one ECU/component | Jbaden1 |
| 6 | 0b | 2019-02-04 | * Change: Chapter “Interface Requirements” added to “Implemented Function xxx” section (to have a single chapter for to collect subscriber/publisher interface and mapping requirements which to not conform to the corresponding Data Dictionary objects) * Change: “CAN Interface” subsection renamed to “AIS Interfaces” again. Although several Subscriber/Publisher interface attributes are probably CAN bus specific, other attributes seem to be well suited for other networks than CAN. * Change: Chapter “ECU Specific Requirements” renamed to “Component Specific Requirements” in chapter “Implemented Function xxx”. Table “Requirements not cascaded” renamed to “Component Specific Requirements” and refined to describe changes from Logical Function requirements set more formally. This is also to help during VSEM import to identify those requirements of the Logical Function which cannot be simply carried over to the ECU. * Change: Explanatory text in section “Implemented Function xxx” improved. | Jbaden1 |
| 6 | 0c | 2019-02-05 | * Change: Layout of AIS Interfaces in Data Dictionary reworked to enable Excel Import | Jbaden1 |
| 6 | 0c | 2019-02-20 | * Bugfix: In AIS Interfaces none-picklist fields formatted as invisible | Jbaden1 |
| 6 | 1a | 2019-02-05 | Functional Safety related changes:   * Table “Architectural Redundancy Summary” updated * Section “Functional Flows for FTTI ‘xyz’” added to chapter “Component Interaction Diagrams” * Fault Tolerant Time Summary section added to Functional Safety chapter * Chapter “HW Metrics” added | Jbaden1 |
| 6 | 1a | 2019-04-02 | Headings of “Architectural Redundancy Summary” table clarified | Jbaden1 |
| 6 | 1a | 2019-04-10 | * ASIL Decomposition table moved from Function Spec into the Feature Implementation Spec (ASIL Decomposition of Technical Safety Requirements) * 2 alternative versions of the Function Allocation Table (Standard variant vs. Functional Safety variant) placed next to each other. | Jbaden1 |
| 6 | 1a | 2019-05-31 | * Function Allocation Table split into a base (non FuSa) part and a FuSa part to allow a more flexible mapping of MBSE functions (Logical and Technology) to RE functions (Atomic Logical and Implemented). | Jbaden1 |
| 6 | 1a | 2019-05-31 | * “Input Requirement” section reworked (symmetrically to all other templates). * Sections “Functional Flows for FTTI xyz” and “Fault Tolerant Time Summary” removed, because guidance is not available yet. * “Reference” and “Glossary” section moved back to introduction, i.e., to the very beginning of the document (such that also section 2 can already rely on it). * Some mostly editorial changes per request from FuSa team. | Jbaden1 |
| 6 | 1a | 2019-07-02 | * "Important" box added on cover sheet which points to the macros * “Input Requirements” section renamed to Input Information (after discussion with FuSa team) | Jbaden1 |
| 6 | 1a | 2019-07-17 | * Chapter “Message List” removed from CAN and LIN specific chapters of section “Requirements on Connections” | Jbaden1 |
| 6 | 1a | 2019-10-08 | * Chapter “ASIL Decomposition of Technical Safety Requirements”: Input TSRs are specified in the chapter right above the decomposition table. | Jbaden1 |
| 6 | 1a | 2019-10-09 | * Chapter “Service Oriented Communication” moved to section “Messages” in the Data Dictionary. Details from Central SW Wiki about FNV2 SOA added | Jbaden1 |
| 6 | 1a | 2019-10-25 | * Minor updates for HW IOs/Signals * Subsection “Functional Safety” removed from chapter “Feature Implementation Modeling”. Per requrest from FuSa team since no guidance is available how to model e.g. FHT timing diagram. | Jbaden1 |
| 6 | 1a | 2019-05-11 | * Copyright notice shortened and moved to cover sheet and added to footer (to be compliant [with Ford copyright guidelines](http://www.fgti.ford.com/client/NewFGTI/CopyrightNotice.html)) * Term “Disclaimer” no longer used for what is actually only a copyright notice | Jbaden1 |
| 6 | 1a | 2019-22-11 | * Some minor modifications for the SOA APIs/MQTT Messages in the section “Messages” of the Data Dictionary (section references Service Contracts via the API name) * Some minor updates of the Input/Output mapping tables in section “Requirements on Components” for mappings to SOA APIs and EDAS signals. | Jbaden1 |
| 6 | 1a | 2019-12-05 | * Upstream Documents section added to “Input Requirements/Documents” table * Custom style table formatting removed | Jbaden1 |
| 6 | 1a | 2020-01-07 | * Some fine tuning for naming conventions of E/E components and connections. * List of HW I/O signal types reduced to RF-A, RF-D, D, A, Networked and PWM. * Protocol column added to the E/E connection table | Jbaden1 |
| 6 | 1a | 2020-01-07 | * “HW Metric” and “Architecture Redundancy Summary” sections removed per request from the Functional Architecture Team (based on Governance Board decision [FSTGB-97](mailto:TrackLite%20%23%20FSTGB-97:%20https://www.tracklite.ford.com/prweb/PRAuth/TrackLiteSSO?pyActivity=@baseclass.RedirectAndRunWraper&ThreadName=WorkLinkThread&bPurgeTargetThread=true&AccessGroupName=FSTGB:ProjectAdministrators&Location=pyActivity%3DWork-.Open%26Action%3DReview%26HarnessPurpose%3DReview%26InsHandle%3DFORD-FSTGB-WORK+FSTGB-97)) * “Functional Safety” chapter moved to “Feature Implementation Requirements” section. “Function Allocation” chapter seemed no longer appropriate. | Jbaden1 |
| 6 | 1a | 2020-01-07 | * Ordering of fields in AIS interfaces tables modified to conform with the Macro Template and the Importer Sheet * Page Header: no longer in bold letters | Jbaden1 |
| 6 | 1a | 2020-03-09 | * Missing doc property “LatestSigMappingID” and “LatestAisInterfaceID” added * doc property “CopyrightDate” re-formatted to text and copyright date field in footer corrected * Version numbering re-initialized as 0.1 * Init value of version/revision date set to “yyyy/mm/dd” instead of “yyyy-mm-dd” to be in line with the “Edit Document Property” dialog * Type of “Latest….ID” doc properties changed from Text to Number | Jbaden1 |
| 6 | 1a | 2020-03-11 | * “Mapping” table removed from template. Has been migrated to macro. | Jbaden1 |
| 6 | 1a | 2020-03-13 | * Separate chapter “Technical Safety Requirements” removed. Content already covered by Allocation Table in chapter Function Allocation. * “Implemented Function” replaced by term “Technology Function” | Jbaden1 |

# Appendix

## Data Dictionary

### Logical Signals

**#Hint:** Logical Signals are managed in VSEM in the [*RE Data Dictionary*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SoYl_k7px3NrTD&servername=Production_Server).

**#Link**: [*RE Wiki – Adding a Logical Signal or Parameter*](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

**#Macro**: Add Ins -> Add Requirement macro (select “Logical Signal” as type)

### Logical Parameters

**#Hint:** Logical Parameters are managed in VSEM in the [*RE Data Dictionary*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SoYl_k7px3NrTD&servername=Production_Server).

**#Link**: [*RE Wiki – Adding a Logical Signal or Parameter*](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

**#Macro:** Add Ins -> Add Requirement macro (select “Logical Parameter” as type)

### Technical Signals

**#Hint:** This section lists all GSDB + GDT + SW signals relevant for the feature deployment.

**#Link**: [*RE Wiki – Adding a Technical Signal or Parameter*](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Technical+Signal+or+Parameter)

**#Macro:** Add Ins -> Add Requirement macro (select “Technical Signal” as type)

#### GSDB Signals

**#Hint:** This part of the Data Dictionary lists signals, which should go to the GSDB in VSEM, but do not exist in the GSDB in VSEM yet, but are or will be requested for the GSDB. Those would go temporarily to this section in the [*RE Data Dictionary*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SoYl_k7px3NrTD&servername=Production_Server) in VSEM.

#### HW I/Os

**#Hint:** This chapter lists signals, which will be mapped to hardwired I/Os. Those get typically refer to VSEM EDAS signals (or input/output signals of device transmittals in VSEM GDT).

#### Diagnostic Interfaces

**#Hint:** This chapter lists Diagnostic Interfaces (DTCs and DIDs), which get mapped to Logical Parameters in context of the Technology Functions in chapter “Parameters” of the Function Interfaces. Those DTC/DID names should match the names in the diagnostics specification (Part 2).

**#ToDo:** Currently the template below is just a proposal. A macro still needs to be created

##### DTCs

###<DTC\_<ID>>### <DTC Name>

<Some Description of the DTC.

Refer to VSEM document “[Diagnostic Fault Coverage and DTC Numbers](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=yAUtrNhnx3NrTDAAAAAAAAAAAAA&servername=Production_Server)

[Design Consideration](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=yAUtrNhnx3NrTDAAAAAAAAAAAAA&servername=Production_Server)”, what to fill into the attributes below>

|  |  |
| --- | --- |
| **Test Period Time** |  |
| **Test Run Criteria,** |  |
| **Enable Criteria (EC)** |  |
| **Applicable** |  |
| **FailureTypeBytes** |  |
| **Test Period Time** |  |
| **Test Run Criteria,** |  |

##### DIDs

**#Hint**: This section lists diagnostic DID which Technical Parameters get mapped to.

**#Todo**: A proper template derived from the Part 2 spec still needs to be created.

### Technical Parameters

**#Hint:** This section lists all Method 2, Method 3 and calibration parameters relevant for the feature deployment.

**#Link**: [*RE Wiki – Adding a Technical Signal or Parameter*](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Technical+Signal+or+Parameter)

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#HowtousetheSpecificationTemplates-AddNewRequirement) (select “Technical Parameter” as type)

### Mappings

**#Hint**: This section lists mapping objects for Logical Signals / Parameters to their GSDB + GDT + SW counterparts (1:N mapping is supported). Mapping objects are managed in VSEM in the [*RE Data Dictionary*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SoYl_k7px3NrTD&servername=Production_Server).

**#Link:** [RE Wiki – Adding a Signal or Parameter Mapping](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Signal+or+Parameter+Mapping)

**#Macro:** Add Ins -> Add Requirement macro (select “Mapping” as type)

### Technical Interfaces

Defines in DVR UART protocol spec.

#### AIS Interfaces

**#Hint:** This chapter lists the AIS subscriber and publisher interface objects (managed in VSEM), which are needed to deploy the feature to the E/E architecture. If AIS interfaces do not yet exist in VSEM, those may temporarily be managed as a workaround in the [*RE Data Dictionary*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=SoYl_k7px3NrTD&servername=Production_Server).

**#Link:** [System Engineering Portal – AIS Release 3.2](https://pd3.spt.ford.com/sites/fede/vsem-spls/Shared%20Documents/02-ais/methods/AIS%20Methods%20Document.pptx?web=1)  
[RE Wiki - AIS Interfaces](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Technical+Interface#AddingaTechnicalInterface-AisInterfaces)

[*Publisher Interface AIS in VSEM*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=zjYtY3Jcx3NrTDAAAAAAAAAAAAA&servername=Production_Server)

[*Subscriber Interface AIS in VSEM*](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=LSYtewY7x3NrTDAAAAAAAAAAAAA&servername=Production_Server)

**#Macro:** Add Ins -> Add Requirement macro (select “AIS Subscriber If” or “AIS Publisher If” as type)

##### Publisher Interfaces

##### Subscriber Interfaces

#### AUTOSAR Ports

**NA.**

### Messages/APIs

#### CAN Bus “<Bus Name>”

**#Hint:** This section gives the relevant extract from the [Central Message Database (CMDB) in VSEM](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=jXfpx2PHx3NrTDAAAAAAAAAAAAA&servername=Production_Server) .

###<MSG\_MessageID### MessageName

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CAN ID** | **Transmission Mode** | **Period** | **Signal Names** | **Transmitter(s)** | **Receiver(s)** |
|  |  |  |  |  |  |
|  |
|  |
|  |

#### LIN Bus “<Bus Name>”

#### AUTOSAR Interfaces

**#Hint:** Those AUTOSAR Classic (Sender/Receiver and Client/Server) Interfaces, which are used by the feature but not managed in a central repository yet, should be listed here.

#### SOA Service Contracts

**#Hint:** This part of the Data Dictionary lists Service APIs/MQTT messages and embedded data elements, which are used for the Service Oriented Architecture (SOA). If those APIs/MQTT messages already exist e.g. in the [*Central SW Service Catalog*](http://wiki.ford.com/display/CS/Service+Catalog), simply add a reference to those yet.

Information on FNV2 SOA can be found in the ECG wiki page

* MQTT Topic Naming: [*FNV2-SOA: MQTT Topic and Message Structure*](https://www.eesewiki.ford.com/display/ecg/FNV2-SOA%3A+MQTT+Topic+and+Message+Structure?src=sidebar)
* message syntax and proper naming can be found [*SOA API Messaging Guidelines*](https://www.eesewiki.ford.com/x/Q7rKAg)

For examples what to fill into the table fields below refer to [*Central SW Service Catalog*](http://wiki.ford.com/display/CS/Service+Catalog)

###<ServiceContractID>### Service Contract Name

<Service contract purpose/behavior>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Messaging Pattern | Frequency  (For Data Broadcast Only) | Message Data Element(s)  (Must Match GPB) or applicable CAN signal | Description of Data Element(s) | Topic Name |
| Choose an item. |  | GBP Data element / CAN Signal name 1 | Detailed encoding of data element 1 |  |
| … |  |  |
| GBP Data element / CAN Signal name 1 | Detailed encoding of data element 3 |  |

### Encoding Types

**#Link:** [*RE Wiki – Adding Encoding Types*](http://wiki.ford.com/display/RequirementsEngineering/Adding+an+Encoding+Type)

**#Macro:** Add Ins -> Add Requirement macro (select “Encoding Type” as type)

Document ends here.