# STNL-FRD-REQ-415442/A-Sentinel-ECG [Sentinel-ECG]



**Research & Vehicle Technology**

**“Infotainment Systems Product Development”**

**Feature – Sentinel**

**ECG Subsystem Part Specific Specification (SPSS)**

Version 1.0

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**Version Date: Jan. 21, 2021**

**FORD CONFIDENTIALF**

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Ver** | **Notes** | |
| **Jan. XX, 20XX** | **1.0** | **Initial Release** |  |
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|  |  |  |  |

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## Overview

The purpose of this document is to describe the feature function requirements for “Sentinel” Feature. This document describes the usage of the Sentinel Feature in the vehicle from different actor’s perspective.

Sentinel feature is a connected intelligent system offering security services to the users against theft and intrusion inside the truck bed, cargo area and surrounding the vehicle particularly for commercial vehicle customers

Sentinel feature is an integrated security system that enables the user to

* Detect intruders using AJAR sensors (or any sensor in the combined sensor module), Perimeter sensors, as well as accelerometer sensor
* Send a notification to the user about the detected intrusion,
* Start recording the video feed from the vehicle cameras locally on the vehicle and on the cloud,
* Enable streaming directly to a subscription app on the customer’s mobile device.

The requirements on the functionality are described either as use cases or as conventional functional decomposition. This document only defines the functionality on an abstract level, focusing on what the system SHALL perform, not detailing how.

Model Year: MY23 and beyond

Region: TBD

## Architectural Design

### STNL-CLD-REQ-415443/A-VRPInterfaceServer [VRPInterfaceServer]

The VRPInterfaceServer is responsible for the tasks listed below:

* Receiving data and status from SentinelInterfaceServer
* Receives Input and sends Request to the SentinelInterfaceServer
* Records data and Video to the In-vehicle Storage device

### STNL-CLD-REQ-415444/A-SentinelInterfaceServer [SentinelInterfaceServer]

The SentinelInterfaceServer is responsible for the tasks listed below:

* Monitoring and handling active function and data.
* Receive Request from the VRPInterfaceServer, SentinelOffBoardServer.
* Transmitting data and status to VRPInterfaceServer, SentinelOffBoardServer.
* Request and video from CameraManager
* Receive information from CameraManager and transmit it to VRPInterfaceServer, SentinelOffBoardServer

### STNL-CLD-REQ-427710/A-SentinelOffBoardServer [SentinelOffBoardServer]

The SentinelOffBoardServer is responsible for the tasks listed below:

* Receiving data and status from SentinelInterfaceServer
* Streams and records data and video and send requests to the SentinelInterfaceServer
* Streams data and video to the Ford Pass App

### STNL-CLD-REQ-427711/A-CameraManager [CameraManager]

The CameraManager is responsible for the tasks listed below:

* Receiving data and status from SentinelInterfaceServer
* Streams data and video to the SentinelInterfaceServer

### STNL-CLD-REQ-427881/A-ExternalSentinelTriggerServer [ExternalSentinelTriggerServer]

The ExternelSentinelTriggerServer is responsible for the tasks listed below:

* Send messages to the SentinelInterfaceServer

### STNL-CLD-REQ-427882/A-SentinelInterfaceClient [SentinelInterfaceClient]

The SentinelInterfaceClient is both the VRPInterfaceServer and SentinelOffBoardServer:

* Receives Input and sends Request to the SentinelInterfaceServer

### Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the Sentinel feature can be mapped into physical modules. This mapping is an example only and does not necessarily carryover to other carlines or vehicle architectures.

|  |  |
| --- | --- |
| **Logical Class** | **Physical Module (ECU)** |
| SentinelInterfaceServer | ECG |
| SentinelInterfaceClient | VRPInterfaceServer SentinelOffBoardServer |
| SentineIOffBoardServer | AWS Cloud |
| ExternelSentinelTriggerServer | Door Ajar module, Radar, Vibrator Sensor module, BCM |
| VRPInterfaceServer | VRP function Sync(USB-VRP), |
| CameraManager | Camera stream |
|  |  |

### Logical Signal Mapping

The CAN signals mentioned throughout this document shall refer to the CAN signal’s logical name. The logical names shall be mapped to their actual CAN signal names. Please use the table below to perform the mapping. The InfoCAN database file is the master file for the actual CAN signal names. Note: There may be cases where the actual CAN signal name is used in this documentation.

|  |  |
| --- | --- |
| **Logical Name** | **CAN Signal Name** |
| IgnitionStatus\_St | Ignition\_Status |
| PerimeterAlarm\_ST | Perimeter\_Alarm\_Status\_ET |
| AlarmTriggeredAlert(FTCP) |  |

### STNL-IIR-REQ-415445/A-SentinelInterfaceServer\_Rx [SentinelInterfaceServer\_Rx]

The interface client shall receive the following signals for the feature to work as needed.

#### MD-REQ-415447/A-IgnitionStatus\_St [IgnitionStatus\_St]

Message Type: Status

Signal used to indicate ignition state.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| IgnitionStatus\_St | - | - | Indicates ignition state |
|  | Unknown | 0x0 |  |
|  | Off | 0x1 |  |
|  | Accessory | 0x2 |  |
|  | Run | 0x4 |  |
|  | Start | 0x8 |  |
|  | Invalid | 0xF |  |

#### MD-REQ-427641/A-PerimeterAlarm\_ST [PerimeterAlarm\_ST]

Message Type: Status

This Message is received to know the Status of the OTA

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Perimeter\_Alarm\_Status\_ET |  |  |  |
|  | 0x0 | Disarmed |  |
|  | 0x1 | Prearmed |  |
|  | 0x2 | Armed |  |
|  | 0x3 | Activated |  |
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#### MD-REQ-392357/B-SetupVideoStreamSessionCommand [SetupVideoStreamSessionCommand]

Message Type: FTCP

This FTCP message is used to issue a command to set up a video streaming session

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| SetupVideoStreamSessionCommand | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| sdpOffer (optional) | (Refer to protofile) |
| stunServerAddress (optional) | (Refer to protofile) |

#### MD-REQ-392355/B-StartVideoStreamCommand [StartVideoStreamCommand]

Message Type: FTCP

This FTCP message is used to issue a command to start video streaming for a desired camera

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StartVideoStreamCommand | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| *cameraViewId (optional)* | (Refer to protofile) |
| *videoQualityConfigData (optional)* | (Refer to protofile) |

#### MD-REQ-392362/B-StopVideoStreamCommand [StopVideoStreamCommand]

Message Type: FTCP

This FTCP message is used to issue a command to stop an active video stream

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StopVideoStreamCommand | - |

#### MD-REQ-411553/A-PublishRecordingStatus [PublishRecordingStatus]

The VRP Function shall receive a request to publish the video recording status via PublishRecordingStatus.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | |
| **Method Type** | | On-Change | | | | | |
| **QoS Level** | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | |
| **Retained** | | N/A or Yes, No | | | | | |
|  | | | | | | | |
| **R/O** | **Name** | | **Type** | **Literals** | **Value** | **Description** |
| **Request (\_Rq)** | | | | | | | |
| R | PublishRecordingStatus | | Boolean |  |  | the service will broadcast a heartbeat message to indicate that recording is active. |
|  |  | |  | Active | 0X0 |  |
|  |  | |  | Inactive | 0X1 |  |
| **Response (\_Rsp)** | | | | | | | |
|  | NA | |  |  |  |  |

#### MD-REQ-411558/A-PublishRecordingStatusChange [PublishRecordingStatusChange]

PublishRecordingStatusChange.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | |
| **Method Type** | | | On-Change | | | | | |
| **QoS Level** | | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | |
| **Retained** | | | N/A or Yes, No | | | | | |
|  | | | | | | | | |
| **R/O** | **Name** | | | **Type** | **Literals** | **Value** | **Description** |
| **Request (\_Rq)** | | | | | | | | |
| R | PublishRecordingStatusChange | | | Structure | StreamRecordStatus |  | Broadcast the status of any in-progress recording requests as the status changes. Statuses may change from in-progress, to paused, back to in-progress, to completed, or may go into one of several failed states |
|  | StreamRecordStatus | session\_id | | Int32 |  |  | Identifies the recording request session. |
|  | recording\_status | | ENUM |  |  | Status of the video recording |
|  | camera\_view\_id | | ENUM |  |  | Camera View being recorded |
| **Response (\_Rsp)** | | | | | | | | |
|  | NA | | |  |  |  |  |

#### IR-REQ-423317/A-PublishStreamStatus [PublishStreamStatus]

***Purpose:*** This API will allow the consumer to enable or disable an on demand, on change broadcast of video stream statuses.

***Message Pattern:*** On Demand, on Change Broadcast

***Request Topic:*** SERVICE/REQUEST/CAMERA\_MANAGER/INFO\_REQUEST

***Response Topic:*** < Consumer Provided >

***Data Topic:*** SERVICE/DATA/CAMERA\_MANAGER/STREAM\_STATUSES

Note:

When a stream status changes to failed, it is expected that the consumer will still send a stop stream request. This will indicate that the consumer has processed the failure and allow Camera Manager to clean up data and return to a normal state.

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| PublishStreamStatusReq | enum | \_api\_version | see \_ApiVersion Enumeration in the info.proto file. |
|  | enum | publish\_request\_type | Used to identify if the request is to enable or disable the broadcast, see PublishRequestType enum. |
| PublishStreamStatusRsp | enum | resp\_status | Status of the request, see RespStatus enum. |
| PublishStreamStatus | enum | \_api\_version | Version of API |
|  | array | stream\_statuses | Nested message of repeated stream statuses and configs. See Data Structure StreamStatuses |

### STNL-IIR-REQ-415448/A-SentinelInterfaceServer\_Tx [SentinelInterfaceServer\_Tx]

The system shall transmit the following messages

#### MD-REQ-411285/A-StopRecord\_Request [StopRecord\_Request]

The VRPInterfaceServer shall receive a request to Stop the video recording via StopRecord\_Request.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | | |
| **Method Type** | | On-Change | | | | | | | | | |
| **QoS Level** | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | | | | | |
| **Retained** | | N/A or Yes, No | | | | | | | | | |
|  | | | | | | | | | | | |
| **R/O** | **Name** | | **Type** | | **Literals** | | **Value** | | **Description** | |
| **Request (\_Rq)** | | | | | | | | | | | |
| R | StopRecord\_Request | | Int32 | | - | | SessionID | | Stop recording of the Particular Session | |
| R | FeatureID | | Int32 | | - | | 0-100 | | Feature id of requesting feature | |
| R | SessionID | | Int32 | | - | | 0-100 | | The Id for the recording session | |
| **Response (\_Rsp)** | | | | | | | | | | | |
| R | StopRecord\_Response | | Int32 | | - | | SessionID | | Resume recording of the Particular Session | |
|  | RequestStatus | | | Enumeration | |  | |  | |  | |
|  |  | | |  | | RequestStatus\_Success | | 0x0 | | SUCCESS | |
|  |  | | |  | | RequestStatus\_Fail | | 0x1 | | FAIL | |
| R | ErrorDetail | | | Enumeration | |  | |  | |  | |
|  |  | | |  | | None | | 0x0 | | No Error | |
|  |  | | |  | | Command\_not\_Recognised | | 0x1 | | Unknown command in SOA request | |
|  |  | | |  | | Unkown\_Error | | 0x2 | | Failed due to an unexpected error | |
|  |  | | |  | | Invalid\_Request | | 0x3 | | Invalid request structure or parameters | |
|  |  | | |  | | Not\_Supported | | 0x4 | | Request cannot be supported by the particular camera view requested, for instance specifying a resolution that is not supported by the camera for that view. | |
|  |  | | |  | | QUEUE\_FULL | | 0x9 | | Request queue is full, try request again later. | |
|  |  | | |  | | - | | 0-100 | | The Id for the recording session | |
|  | SessionID | | | Int32 | |  | |  | |  | |

#### MD-REQ-406933/A-Record\_Request [Record\_Request]

The request to start the video recording via Record\_Request.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | |
| **Method Type** | | | On-Change | | | | | |
| **QoS Level** | | | Default (unless otherwise specified, ex. 0, 1, 2) | | | | | |
| **Retained** | | | N/A or Yes, No | | | | | |
|  | | | | | | | | |
| **R/O** | **Name** | | | | **Type** | **Literals** | **Value** | **Description** |
| **Request (\_Rq)** | | | | | | | | |
| R | Record\_Request | | | |  | - | - | Request the Video Recording Service to record a video stream for one or more Camera Views. |
| R | FeatureName | | | | String |  |  | Feature name of requesting feature  Size limit=? |
| R | RecordingStorageType | | | | Enum |  |  |  |
|  |  | | | |  | Specified\_USB | 0x0 | Record only to Feature specified USB StorageDeviceID  If StorageDeviceID not available/not connected then there will be an error and recording will not begin |
|  |  | | | |  | AnyTested\_USB | 0x1 | Record to any USB storage device that has been tested and verified as suitable for recording in the vehicle |
|  |  | | | |  | Any\_USB | 0x2 | Attempt to record to any USB Storage device currently connected, whether tested and verified or not. Only if device proves to be unsuitable, will there be an error. |
| O | StorageDevice\_ID | | | | Int32 | - | 0-100 | Storage device id to which data/video will be recorded to |
| R | CameraViewName | | | | String |  |  | Name of the view to be recorded as found in the camera manager published list of camera views |
| O | RecordingMode | | | | Enum |  |  | Mode to use for files creation and out of memory conditions. Continuous or loop. |
|  |  | | | |  | Continuous | 0X0 |  |
|  |  | | | |  | Loop | 0X1 |  |
| O | RecordingDurationType | | | | Enum | - |  | Type of duration, limited or unlimited |
|  |  | | | |  | unlimited | 0X0 |  |
|  |  | | | |  | limited | 0X1 |  |
| O | RecordingDurationTime | | | | Int32 | - | 0-n min | Amount of time to record the camera view(s). |
| O | SegmentDuration | | | | Int32 | - | 0-n min | Duration of each video segment.  Note: Used if desired to make the video into smaller subsegments. (Required for loop mode) |
| O | OutofSpaceStarategy | | | | Enum |  |  | Determines what VRP shall do when running out of space |
|  |  | | | |  | Terminate recording. | 0X0 | Stop recording and send out of space error |
|  |  | | | |  | Delete oldest for feature | 0X1 | Delete the unprotected oldest recording session in the memory for the requesting feature. |
|  |  | | | |  | Delete oldest file in session | 0X2 | Delete the oldest unprotected recording file in this recording session for the requesting feature. |
| O | FrameRate | | | | ENUM |  |  | This enumeration provides the list of supported Frame rates for camera configurations. The desired framerate should be specified when starting a recording, else the current camera setting will be used. |
|  |  | | | |  | FPS\_30 | 0x0 |  |
|  |  | | | |  | FPS\_15 | 0x1 |  |
|  |  | | | |  | FPS\_10 | 0x2 |  |
|  |  | | | |  | FPS\_60 | 0x3 |  |
| O | Resolution | | | | ENUM |  | 0-n mpix | Resolution of the video stream to record. |
|  |  | | | |  | RES\_1280\_BY\_800 | 0x0 | This is a high-resolution setting |
|  |  | | | |  | RES\_640\_BY\_480 | 0x1 | This is a medium resolution setting |
|  |  | | | |  | RES\_480\_BY\_360 | 0x2 | This is a low-resolution setting |
|  |  | | | |  | RES\_1920\_BY\_1080 | 0x3 |  |
|  |  | | | |  | RES\_1280\_BY\_720 | 0x4 |  |
| R | Bitrate | | | | ENUM |  |  | This enumeration provides the list of supported Bitrates for camera configurations. The desired Bitrate should be provided when starting a recording, else the camera’s current setting will be used. |
|  |  | | | |  | KBPS\_10000 |  |  |
|  |  | | | |  | KBPS\_5000 |  |  |
|  |  | | | |  | KBPS\_1000 |  |  |
| R | FreetextMetadataName | | | | string |  | UTF-8 encoded or 7-bit ASCII text |  |
| R | FreetextMetadata | | | | string |  | UTF-8 encoded or 7-bit ASCII text |  |
|  | RecordingName | | | | String |  | UTF-8 encoded or 7-bit ASCII text | Optional name for the recording |
| R | MetadataSelection | Metadata\_field\_name | | String | |  |  |  |
| metadata\_source | | Enumeration | |  |  | Identifies if the data is to come from a CAN signal, or if it is a single value provided by the consumer when making a recording request. |
|  | |  | | CAN | 0X0 |  |
|  | |  | | Provided value | 0X1 | One time only value no frequency |
| CAN\_signal\_source | | String | |  |  | Actual CAN Signal name if data is available from CAN / VIM. |
|  | |  | | GPSLocation (<Latitude>, <Longitude>, <Altitude>) |  | Data present in Functional spec |
|  | |  | | Vehicle speed |  |  |
|  | |  | | OutsideTemperature |  |  |
|  | |  | | VehicleIdentificationNumber |  |  |
|  | |  | | SteeringWheelAnglePosition |  |  |
|  | |  | | Gas |  |  |
|  | |  | | BrakePedals |  |  |
|  | |  | | GForce |  |  |
|  | |  | | EngineRPM |  |  |
|  | |  | | Date |  |  |
|  | |  | | Time |  |  |
| Recording\_frequency | | Integer | |  |  | The frequency in milliseconds at which the CAN Signal Source should be recorded.  Note: there may be a lower limit to this value based on CAN broadcast frequency, and system latency, yet to be determined. |
| Metadata\_string\_value | | String | |  |  | Single value provided by the consumer when that value is a string. |
| Metadata\_integer\_value | | Integer | |  |  | Single value provided by the consumer when that value is an integer. |
| R | EncryptVideo | | | | Boolean |  |  | Should the recording be encrypted or not. |
|  |  | | | |  | Yes | 0X0 |  |
|  |  | | | |  | No | 0X1 |  |
| R | EncryptMetadata | | | | Boolean |  |  | Should the metadata be encrypted or not. |
|  |  | | | |  | Yes | 0X0 |  |
|  |  | | | |  | No | 0X1 |  |
| R | PowerSeverity | | | | Int32 |  |  | Power severity level of the feature used to vote to keep the Video source to be powered. |
| **Response (\_Rsp)** | | | | | | | | |
| R | StartRecord\_Response | | | |  |  |  |  |
|  | RequestStatus | | | | Enumeration |  |  |  |
|  |  | | | |  | RequestStatus\_Success | 0x0 | SUCCESS |
|  |  | | | |  | RequestStatus\_Fail | 0x1 | FAIL |
| R | ErrorDetail | | | | Enumeration |  |  |  |
|  |  | | | |  | None | 0x0 | No Error |
|  |  | | | |  | Command\_not\_Recognised | 0x1 | Unknown command in SOA request |
|  |  | | | |  | Unkown\_Error | 0x2 | Failed due to an unexpected error |
|  |  | | | |  | Invalid\_Request | 0x3 | Invalid request structure or parameters |
|  |  | | | |  | Not\_Supported | 0x4 | Request cannot be supported by the particular camera view requested, for instance specifying a resolution that is not supported by the camera for that view. |
|  |  | | | |  | Storage\_Full | 0x5 | Desired Storage device is full |
|  |  | | | |  | Storage\_Device\_Not\_Found | 0x6 | Requested Storage Device cannot be found. |
|  |  | | | |  | CAMERA\_VIEW\_NOT\_AVAILABLE | 0x7 | Requested Camera View is not available for streaming. |
|  |  | | | |  | CAMERA\_VIEW\_NOT\_RESPONDING | 0x8 | Camera Controller is not responding. |
|  |  | | | |  | QUEUE\_FULL | 0x9 | Request queue is full, try request again later. |
|  |  | | | |  | Encryption\_Failure | 0XA | Encryption Failure |
| R | SessionID | | | | Int32 | - | 0-100 | The Id for the recording session |
| O | StorageDevice\_ID | | | | Int32 | - | 0-100 | Storage device id to which data/video will be recorded to |

#### MD-REQ-392356/B-StartVideoStreamCommandResponse [StartVideoStreamCommandResponse]

Message Type: FTCP

This FTCP message is used to respond to a command to start video streaming for a desired camera

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StartVideoStreamCommandResponse | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| cmdStatus (optional) | (Refer to protofile) |
| errorDetail (optional) | (Refer to protofile) |
| failureReason (optional) | (Refer to protofile) |

#### MD-REQ-392363/B-StopVideoStreamCommandResponse [StopVideoStreamCommandResponse]

Message Type: FTCP

This FTCP message is used to respond to a command to stop an active video stream

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Command** | **Description** |
| StopVideoStreamCommandResponse | - |

|  |  |
| --- | --- |
| **Parameters** | **Values** |
| cmdStatus (optional) | (Refer to protofile) |
| errorDetail (optional) | (Refer to protofile) |

#### IR-REQ-404260/D-StartStream [StartStream]

***Purpose:*** This API will allow the consumer to start a video stream of a single camera view. The consumer can coordinate the start to ensure that all recipients are ready in advance of the stream starting by setting the “reserve\_for\_coordinated\_start” parameter to True. The consumer will receive the intended multicast address, allowing all recipients to connect to the address, and join the multicast group prior to the stream starting.

If a stream is reserved, then the consumer that reserved it must send a Commence Reserved Stream request in order to start the video streaming. If a commence or cancelation request is not received in a reasonable amount of time, the reservation will be automatically canceled or started depending on presence of other consumers for that stream. The stream status will be updated.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICE/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

Notes:

* If the requested resolution, framerate, and bitrate are not supported by the requested View, it will still stream but at the default settings for that view.
* Subsequent requests for an already streaming view will be directed to the in-progress stream, with the existing configuration (resolution, framerate, and bitrate).

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| StartStreamReq | Enum  CameraView | camera\_view | The view requested. |
|  | String | view\_name | As an alternative to the enum above, the consumer can provide a string containing the view name, as listed in the view status broadcast. This is done so that other platform services like Video Recorder, do not have to keep a camera view enum in synch with that of Camera Manager. Instead it can receive a view name from its consumer, and pass that on in this parameter. |
|  | Enum  Resolution | resolution | Desired resolution for the stream |
|  | Enum  FrameRate | frame\_rate | Desired frame rate for the stream |
|  | Enum  BitRate | bit\_rate | Desired bitrate for the stream |
|  | uint32 | power\_severity\_level | Power severity of the feature or function for use when voting to power the camera controllers with VPSM.  NOTE: all key off activities need to be evaluated by power supply team, Hussein Berry or Z Deljevic, in order to get severity assigned. |
|  | string | client\_id | Client Id of the consumer, for use in power requests to VPSM in order to power the camera controller. |
|  | bool | reserve\_for\_coordinated\_start | When set to true Camera Manager will reserve a multicast port for the stream request, but not initiate the stream until it receives a commence reserved stream request.  Default will be False |
| StartStreamRsp | Enum  RespStatus | response\_status | Status of request. |
|  | uint32 | stream\_id | Stream\_id is an auto generated uid by Camera Manager for each video stream. This is used later to change or stop the stream. |
|  | string | ip\_address | Multicast IP Address where the stream can be received (recipient must bind and join the multicast group). |
|  | uint32 | port | Multicast port where the stream can be received. |
|  | Enum  StreamType | stream\_type | Type of stream the consumer will be joining.  This can help the consumer determine if the stream is already in progress or a reserved stream that will not start until the reserving client sends a commence request. |

#### IR-REQ-404261/D-StopStream [StopStream]

***Purpose:*** This API will allow the consumer to stop a particular video stream. If there is more than one recipient of the stream, then Camera Manager will only send the stop request to the video source when the last recipient sends a stop request.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICE/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

Note: It is the consumers responsibility to make sure stop requests are successful. This may mean retrying until a successful response is received, particularly in the event of a communication disruption or system crash. The consumer should persist knowledge about active video streams, and upon restart, ensure that it sends stop requests for any streams that were in process prior to the failure.

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| StopStreamReq | uint32 | stream\_id | Stream Id that is to be stopped. |
|  | string | client\_id | Client Id of the consumer, for use in power requests to VPSM in order to appropriately remove vote to power the camera controller. |
|  | bool | lazy\_power\_off | When set to true Camera Manager will delay powering off the Camera Controller in case the feature is simply switching between views from the same camera controller. This prevents the camera controller from powering down and back up, and unnecessary delays in providing video streams for the consumer. |
| StopStreamRsp | enum | response\_status | Status of request, see RespStatus enum. |

#### IR-REQ-415420/B-CommenceReservedStream [CommenceReservedStream]

***Purpose:*** This interface will allow the consumer to start a stream that was previously reserved by using the “reserve for coordinated start” parameter of the start stream request.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICE/REQUEST/CAMERA\_MANAGER/ STREAM\_CONTROL

***Response Topic:*** < ConsumerProvided>

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| CommenceStreamReq | uint32 | stream\_id | Unique identifier of the stream, that was established by Camera Manager when the stream was reserved. |
|  | string | client\_id | Client Id of the consumer. |
| CommenceStreamRsp | Enum  RespStatus | response\_status |  |

#### REQ-424678/A-CancelReservedStream [CancelReservedStream]

***Purpose:*** This API will allow the consumer to cancel a stream reservation they created, in the event there is no longer a need for the video.

***Message Pattern:*** Request / Response

***Request Topic:*** SERVICE/REQUEST/CAMERA\_MANAGER/STREAM\_CONTROL

***Response Topic:*** < Consumer Provided >

|  |  |  |  |
| --- | --- | --- | --- |
| **Message Name** | **Data Type** | **Message Element Name** | **Description** |
| CancelReservedStreamReq | uint32 | stream\_id | ID of the reserved stream to cancel. |
|  | string | client\_id | Client Id of the consumer. |
| CancelReservedStreamRsp | enum | response\_status | Status of request, see RespStatus enum. |

#### MD-REQ-427885/A-AlarmTriggeredAlert [AlarmTriggeredAlert]

Message Type: FTCP

This alert is used to notify the SentinelOffBoardServer that a PerimeterAlarm\_St has been received by the SentinelInterfaceServer and an intrusion has been confirmed.

**Note:** Refer to the latest “Ford Telematics Communication Protocol Specification” and Protofile for the most up to date FTCP messages/definitions.

|  |  |
| --- | --- |
| **Alert** | **Description** |
| AlarmTriggeredAlert | Alert to describe an Intrusion has been detected |

## General Requirements

### STNL-REQ-415450/A-Power Mode Condition [Power Mode Condition]

The SentinelInterfaceServer shall only allow the functionality defined by this SPSS when the Ignition\_Status =OFF.

### STNL-REQ-415451/A-Feature Configuration [Feature Configuration]

The Sentinel feature shall have a configurable parameter to determine whether the vehicle supports this Feature. Refer to CCS spec for the same

### STNL-REQ-415452/A-Missing Message Strategy [Missing Message Strategy]

The Connection between the ECG and the other depending modules shall determine the communication Failure which intern shall detect the failure in the Function

## Functional Definition

### STNL-FUN-REQ-415453/A-Sentinel Subscription and Enable/Disable Setting [Sentinel Subscription and Enable/Disable Setting]

#### Requirements

##### STNL-REQ-415457/A-Subscription [Subscription]

For subscription details, please refer to the Customer Connectivity Settings Manager SPSS for further detail.

The SentinelInterfaceServer shall receive the configurable parameters from CCSClient that the Subscription is available and Sentinel is enabled via XYZ message (TBD in the CCS spec).Please refer to the Customer Connectivity Settings Manager SPSS for further detail.

##### STNL-REQ-415456/A-Sentinel Enable/Disable [Sentinel Enable/Disable]

For Enable/Disable details, please refer to the Customer Connectivity Settings Manager SPSS for further detail.

The SentinelInterfaceServer shall receive the configurable parameters from CCSClient that the feature is available and Sentinel is enabled/Disabled.

### STNL-FUN-REQ-415543/A-Intrusion Detected and Video Streaming [Intrusion Detected and Video Streaming]

#### Use Cases

##### STNL-UC-REQ-415545/A-Alarm Detection [Alarm Detection]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, ExternelSentinelTriggerServer |
| **Pre-conditions** | Powermode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated  Sentinel is enabled |
| **Scenario Description** | If the ExternelSentinelTriggerServer sends a PerimeterAlarm\_ST signal to the SentinelInterfaceServer the SentinelInterfaceServer shall convey it as an intrusion detected |
| **Post-conditions** | Start the IPPT process to set up the session with the SentinelOffBoardServer.  Notify the SentinelOffboardServer and Start Timer |
| **List of Exception Use Cases** | Loss of connection with BCM |
| **Interfaces** |  |

##### STNL-UC-REQ-425358/A-Intrusion Detection Notification Cloud and Monitor Existing Stream [Intrusion Detection Notification Cloud and Monitor Existing Stream]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelOffboardServer |
| **Pre-conditions** | Powermode conditions are met  Intrusion detected  SentinelInterfaceServer awake |
| **Scenario Description** | When a vehicle intrusion event is detected the SentinelInterfaceServer shall send AlarmTriggeredAlert to SentinelOffboardServer.  The SentinelInterfaceServer shall set the Initiate\_timer=20s to wait for video recipients to be ready prior to commencing the stream.  If the camera manager is streaming a desired view then the recording shall start with that stream else if not a desired stream then the SentinelInterfaceServer shall stop streaming.  If no streaming is happening previously then reserve stream. |
| **Post-conditions** | The SentinelInterfaceServer shall start recording to the VRP and sending video the cloud or start stream reserve |
| **List of Exception Use Cases** | Lost communication with the camera manager |
| **Interfaces** |  |

##### STNL-UC-REQ-415470/A-Reserve video stream [Reserve video stream]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager |
| **Pre-conditions** | Powermode conditions are met  SentinelInterfaceServer awake  Intrusion detected  Alert is sent to the SentinelOffboardServer |
| **Scenario Description** | The SentinelInterfaceServer shall send request to the CameraManager to start video stream reserve |
| **Post-conditions** | The connection with ports and IP address shall then be established with the SentinelInterfaceServer as a response. |
| **List of Exception Use Cases** | No response from camera manager |
| **Interfaces** | SOA |

##### STNL-UC-REQ-415490/A-Request VRP for StartRecording [Request VRP for StartRecording]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met |
| **Scenario Description** | SentinelInterfaceServer shall request the VRPInterfaceServer to start recording by providing the Ip Address and port |
| **Post-conditions** | SentinelInterfaceServer shall receive the VRP record status as ready. |
| **List of Exception Use Cases** | Lost Connection with the Sync |
| **Interfaces** | SOA |

##### STNL-UC-REQ-423308/A-Video Stream-Send to cloud and Accept [Video Stream-Send to cloud and Accept]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met |
| **Scenario Description** | When the SentOffboardServer sends StartVideoStreamCommand to the SentinelInterfaceServer then the SentinelInterfaceServer shall respond StartVideoStreamCommandResponse to the SentOffboardServer |
| **Post-conditions** | SentinelInterfaceServer shall commence video to the cloud |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection |
| **Interfaces** | SOA |

##### STNL-UC-REQ-415471/A-Video Stream - Commence Stream [Video Stream - Commence Stream]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, CameraManager, SentinelOffboardServer, VRPInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met |
| **Scenario Description** | SentinelInterfaceServer shall request the CameraManager to commence the video to the VRPInterfaceServer and the SentinelOffboardServer When one the following conditions are met:  Condition 1:   * The SentinelInterfaceServer shall receive a ready broadcast message from the VRP to trigger Video Stream.   And   * SentinelOffboardServer shall send StartVideoStreamCommand to SentinelInterface.   Condition 2:   * Initiate\_Timer has expired and only one of the following has occurred:   + Then SentinelInterfaceServer shall receive a ready broadcast message from the VRP to trigger Video Stream.   or   * + SentinelOffboardServer shall send StartVideoStreamCommand to SentinelInterfaceServer.   Else  SentinelInterfaceServer shall cancel the reserve stream and log appropriate errors. |
| **Post-conditions** | Video is being to recorded to usb and being sent to the cloud. |
| **List of Exception Use Cases** | Lost connection with the cloud  Poor internet connection  Lost connection with Sync |
| **Interfaces** |  |

##### STNL-UC-REQ-426898/A-Set Record Timer [Set Record Timer]

|  |  |
| --- | --- |
| **Actors** | SentInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met |
| **Scenario Description** | Once the SentInterfaceServer shall request for CommenceVideoStream the SentInterfaceServer shall set the RecordTimer= 5 min to set duration of the recording |
| **Post-conditions** | Video is being to recorded to usb and being sent to the cloud within the duration of the timer |
| **List of Exception Use Cases** | Lost connection with Sync  Lost connection with the cloud  Poor internet connection |
| **Interfaces** |  |

##### STNL-UC-REQ-426899/A-Record Timer Expires [Record Timer Expires]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met |
| **Scenario Description** | Once the RecordTimer= 5min timesout SentinelInterfaceServer shall request VRPInterfaceServer to stop recording |
| **Post-conditions** | Video stops recording to usb and stream stops being sent to the cloud |
| **List of Exception Use Cases** | Lost connection with Sync  Lost connection with the cloud  Poor internet connection |
| **Interfaces** | SOA,CAN |

##### STNL-UC-REQ-426897/A-Video Stream-Stop [Video Stream-Stop]

|  |  |
| --- | --- |
| **Actors** | CameraManager, SentinelInterface |
| **Pre-conditions** | Powermode Conditions are met   * Recording duration timer (5 min) has been met. * Sentinel Unavailable condition occurrences. * Or any Failure mode behavior (eg: errors or disconnections). * Or STNL-REQ-415481/A-Stop Record conditions have occurred |
| **Scenario Description** | SentinelInterfaceServer shall send StopStreamRq() to the CameraManager |
| **Post-conditions** | Video Streaming Stops |
| **List of Exception Use Cases** | No response from the CameraManager |
| **Interfaces** | SOA |

#### Requirements

##### STNL-REQ-415553/A- Alarm Detection [ Alarm Detection]

If the ExternelSentinelTriggerServer sends a PerimeterAlarm\_ST=”0x3”/Activated signal to the SentinelInterfaceServer shall consider it as intrusion detected.

The SentinelInterfaceServer shall be able to start the IPPT process to set up the session with the SentinelOffBoardServer.

##### STNL-REQ-415557/A-Intrusion Detection Notification Cloud and Monitor Existing Stream [Intrusion Detection Notification Cloud and Monitor Existing Stream]

When a vehicle intrusion event is detected the SentinelInterfaceServer shall send AlarmTriggeredAlert to SentinelOffboardServer.

The SentinelInterfaceServer shall set the Initiate\_timer=20s to wait for video recipients to be ready prior to commencing the stream.

SentinelInterfaceServer shall monitor PublishStreamStatus broadcast from the camera manager to check:

If any desired view is already streaming:

* Then the SentinelInterfaceServer shall verify :

if the SentinelOffboardServer is receiving the same stream then SentinelInterfaceServer shall request start recording via STNL-REQ-415493/A-Video Stream Send to Cloud and Accept and/or STNL-REQ-425917/A-Request VRP for StartRecording

* + Else SentinelInterfaceServer shall send a Start stream to Camera Manager to receive existing stream IP address and Port to be send to VRPInterfaceServer.

Else if its not a desired view

If the SentinelInterfaceServer or SentinelOffboardServer is receiving that view then the SentinelInterfaceServer shall request STNL-REQ-415491/A-Video Stream -Stop and send an alert to the SentinelOffboardServer (which alert is this)

Else if SentinelInterfaceServer or SentinelOffboardServer is not receiving that view then continue to STNL-REQ-415495/A-Reserve Video Stream

Check if we can use the existing alert or create a new alert AlarmTriggeredAlert

##### STNL-REQ-415495/A-Reserve Video Stream [Reserve Video Stream]

For all the other views where SentinelInterfaceServer does not already have a stream, send request to the CameraManager to start video streams (reserved) with StartStreamRq as referred in the IR-REQ-404260/C-StartStream in the CameraManagerService Spec.

##### STNL-REQ-425917/A-Request VRP for StartRecording [Request VRP for StartRecording]

After the reserve stream successful or the SentinelInterfaceServer receives Inprogress Stream, then the SentinelInterfaceServer shall send the IP address and the port id via Record\_Request to VRPInterfaceServer. Refer to STNL-REQ-415479/A-Record to USB for more details on recording request.

##### STNL-REQ-415493/A-Video Stream Send to Cloud and Accept [Video Stream Send to Cloud and Accept]

When the SentOffboardServer sends StartVideoStreamCommand  to the SentinelInterfaceServer then the SentinelInterfaceServer shall respond via MD-REQ-392356/B-StartVideoStreamCommandResponse to the SentOffboardServer refer to the MDV-FUN-REQ-391508/A-Initiate Video Stream in the MDV SPSS for more details in the requirements

##### STNL-REQ-415494/A-Video Stream-Commence Stream [Video Stream-Commence Stream]

SentinelInterfaceServer shall request the CameraManager to commence the video to the VRPInterfaceServer and the SentinelOffboardServer with CommenceReservedStream API as referred in the IR-REQ-415420/A-CommenceReservedStream in the CameraManagerService Spec. When one the following conditions are met:

Condition 1:

* The SentinelInterfaceServer shall receive a ready broadcast message from the VRP to trigger Video Stream.

And

* SentinelOffboardServer shall send StartVideoStreamCommand to SentinelInterfaceServer.

Condition 2:

* Initiate\_Timer has expired and only one of the following has occurred:
  + Then SentinelInterfaceServer shall receive a ready PublishRecordingStatusChange broadcast message from the VRPInterfaceServer to trigger Video Stream.

or

* + SentinelOffboardServer shall send StartVideoStreamCommand to SentinelInterfaceServer.

Else

When Initiate\_Timer has expired and no response comes from either of the SentinelOffboardServer or VRPInterfaceServer, then the SentinelInterfaceServer shall cancel the reserve stream and log appropriate errors.

Question:

1.Will we have an exception that if we receive alarm is it ok to start with the listed camera view

2.if the camera manager sends the view name we need to match the view name with the one hard coded in the ECG If the view name does not match the video will not be sent to the cloud.

##### STNL-REQ-425900/A-Set Record Timer [Set Record Timer]

Once the SentinelInterfaceServer shall request for CommenceVideoStream the SentinelInterfaceServer shall set the RecordTimer= 5 min to set duration of the recording.

##### STNL-REQ-425921/A-Record Timer Expires [Record Timer Expires]

Once the RecordTimer= 5min timesout SentinelInterfaceServer shall request VRPInterfaceServer to stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS.

##### STNL-REQ-415491/A-Video Stream -Stop [Video Stream -Stop]

SentinelInterfaceServer shall send StopStreamRq() to the CameraManager as referred in the IR-REQ-404261/C-StopStream in the CameraManagerService Spec.

SentinelInterfaceServer shall send StopStream if and only if either of the conditions are met:

* Recording duration timer (5 min) has been met.
* Sentinel Unavailable condition occurrences.
* Or any Failure mode behavior (eg: errors or disconnections).
* Or STNL-REQ-415481/A-Stop Record conditions have occurred

Note: SentinelOffBoardServer shall stop recording automatically when the CameraManager stops streaming

#### White Box View

##### Activity Diagrams

###### STNL-ACT-REQ-415560/A-Intrusion Detected and Video Streaming [Intrusion Detected and Video Streaming]

Activity Diagram



##### Sequence Diagrams

###### STNL-SD-REQ-415561/A-Intrusion Detected and Video Streaming [Intrusion Detected and Video Streaming]

Constraints

Pre-Condition

Scenarios

Normal Usage

Post-Condition

Sequence Diagram

TBD

### STNL-FUN-REQ-415463/A-Record Video-USB/Cloud [Record Video-USB/Cloud]

#### Use Cases

##### STNL-UC-REQ-415465/A-Record to USB [Record to USB]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer |
| **Pre-conditions** | Powermode Conditions are met  VRPInterfaceServer is ON  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated  SentinelInterfaceServer is Sending SentinelMode.St as ON  ReserveStream is successful.  VRP broadcasts ready to record and Storage available  CommenceVideoStream has been Successful.  Set RecordTimer= 5min |
| **Scenario Description** | When SentinelInterfaceServer shall send Start Record request to the VRPInterfaceServer. |
| **Post-conditions** | USB shall start recording and storing video |
| **List of Exception Use Cases** | Lost connection with the Sync  USB not available |
| **Interfaces** | CAN, Ethernet |

##### STNL-UC-REQ-415472/A-Record-Cloud [Record-Cloud]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentInterfaceOffBoardServer |
| **Pre-conditions** | Power mode Conditions are met  SentInterfaceOffBoardClient, is ON  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated   * Internet and Cloud Connectivity is strong and connected * SentinelInterfaceServer is Sending SentinelMode.St as ON * ReserveStream is successful. * Initiation for video streaming has been established from SentinelOffBoardServer * CommenceVideoStream has been Successful. * Set RecordTimer= 5min |
| **Scenario Description** | The SentinelInterfaceServer shall stream videos to SentinelOffboardServer |
| **Post-conditions** | Cloud shall start recording and storing video |
| **List of Exception Use Cases** | Lost connection with the TCU  Cloud connection not available |
| **Interfaces** | CAN, Ethernet |

##### STNL-UC-REQ-415466/A-Record-Stop [Record-Stop]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, VRPInterfaceServer, ExternelSentinelTriggerServer |
| **Pre-conditions** | Power mode Conditions are met  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | The SentinelInterfaceServer shall stop recording when either of the following occur:   * Sentinel is unavailable * Loss of connection with either of the VRPInterfaceServer, SentInterfaceOffBoardServer. * STNL-REQ-425921/A-Record Timer Expires |
| **Post-conditions** | Recording stops in USB and Cloud |
| **List of Exception Use Cases** | Lost connection with the TCU  Lost connection with the Sync  USB not available  Cloud connection lost  Subscription expires |
| **Interfaces** | CAN, Ethernet, Wifi |

#### Requirements

##### STNL-REQ-415479/A-Record to USB [Record to USB]

The SentinelInterfaceServer shall send videos to the VRPInterfaceServer via VRP-REQ-407061/A-Record from the VRP SPSS to record videos and meta data in the USB

##### STNL-REQ-415480/A-Record to Cloud [Record to Cloud]

The SentinelInterfaceServer shall stream videos to SentinelOffboardServer via MDV-FUN-REQ-391508/A-Initiate Video Stream from the MDV SPSS to record videos to the SentinelOffboardServer.

##### STNL-REQ-415481/A-Stop Record [Stop Record]

The SentinelInterfaceServer shall stop recording when either of the following occur:

* Sentinel is unavailable
* Loss of connection with either of the VRPInterfaceServer, SentinelOffBoardServer (TBD need more information from the function spec)
* STNL-REQ-425921/A-Record Timer Expires

Or

When the SentinelInterfaceServer is monitoring PublishRecordStatusChange from VRPInterfaceServer if it reads stop then SentinelInterfaceServer shall request stop recording via StopRecordRequest refer to VRP-REQ-407064/A-Stop Record in the VRP SPSS.

Or

SentinelOffBoardServer to stop recording via StopStreamRequest refer to MDV-FUN-REQ-392057/A-Terminate Video Stream

#### White Box View

##### Activity Diagrams

###### STNL-ACT-REQ-425301/A-Record to USB [Record to USB]

Activity Diagram



###### STNL-ACT-REQ-425302/A-Record-Cloud [Record-Cloud]

Activity Diagram



###### STNL-ACT-REQ-425303/A-Record-Stop [Record-Stop]

Activity Diagram



##### Sequence Diagrams

###### STNL-SD-REQ-415487/A-Record to USB [Record to USB]

Sequence Diagram



###### STNL-SD-REQ-428539/A-Record to Cloud [Record to Cloud]

Sequence Diagram



###### STNL-SD-REQ-428540/A-Record- Stop [Record- Stop]

Sequence Diagram

### STNL-FUN-REQ-415498/A-Sentinel Feature Unavailable [Sentinel Feature Unavailable]

#### Use Cases

##### STNL-UC-REQ-409092/A-OTA Update in progress [OTA Update in progress]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelOffboardServer, |
| **Pre-conditions** | Powermode Conditions are met  SentinelOffboardServer is ON  SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | If the OTA update is in progress sentinel feature shall not work. |
| **Post-conditions** | Sentinel feature is not working per expected |
| **List of Exception Use Cases** |  |
| **Interfaces** |  |

##### STNL-UC-REQ-409093/A-No Sentinel Subscription [No Sentinel Subscription]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelOffboardServer, |
| **Pre-conditions** | Powermode Conditions are met  SentInterfaceOffBoardServer is ON, SentinelOffboardClient is ON, SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | If no sentinel subscription is available the SentinelInterfaceServer shall not work. |
| **Post-conditions** | Sentinel feature is not working per expected |
| **List of Exception Use Cases** |  |
| **Interfaces** |  |

##### STNL-UC-REQ-409094/A-Low Battery [Low Battery]

|  |  |
| --- | --- |
| **Actors** | SentinelInterfaceServer, SentinelInterfaceOffBoardServer, |
| **Pre-conditions** | Powermode Conditions are met  SentInterfaceOffBoardServer is ON, SentinelOffboardClient is ON, SentinelInterfaceServer is ON  Subscription is available  User is Authenticated |
| **Scenario Description** | If the SentinelInterfaceServer receives BatteryCapacity\_Status as below 40 % of the Battery capacity, then SentinelInterfaceServer shall not work |
| **Post-conditions** | Sentinel feature is not working per expected |
| **List of Exception Use Cases** |  |
| **Interfaces** |  |

#### Requirements

##### STNL-REQ-415504/A-Sentinel Unavailable Behavior [Sentinel Unavailable Behavior]

When the SentinelInterfaceServer meets any of the conditions below then the feature shall not be able to function per expected.

##### STNL-REQ-415501/A-OTA update in progress [OTA update in progress]

If the OTA update is in progress sentinel feature shall not work.

##### STNL-REQ-415502/A-No Sentinal Subscription [No Sentinal Subscription]

If no sentinel subscription is available the SentinelInterfaceServer shall not work.

What is the info that is valid here from CCS to indicate that there is no subscription

##### STNL-REQ-415503/A-Low Battery [Low Battery]

If the SentinelInterfaceServer receives BatteryCapacity\_Status as below 40 % of the Battery capacity, then SentinelInterfaceServer shall not work

Need to understand where and who is calculating the Battery capacity

#### White Box View

##### Activity Diagrams

##### Sequence Diagrams

### STNL-FUN-REQ-415531/A-External module Control [External module Control]

#### Use Cases

##### STNL-UC-REQ-415533/A-SYNC Shutdown [SYNC Shutdown]

|  |  |
| --- | --- |
| **Actors** |  |
| **Pre-conditions** |  |
| **Scenario Description** | NO details |
| **Post-conditions** |  |
| **List of Exception Use Cases** |  |
| **Interfaces** |  |

#### Requirements

##### STNL-REQ-415537/A-SYNC Shutdown [SYNC Shutdown]

.

#### White Box View

##### Activity Diagrams

###### STNL-ACT-REQ-415541/A-\* [\*]

Activity Diagram

##### Sequence Diagrams

###### STNL-SD-REQ-415542/A-\* [\*]

Constraints

Pre-Condition

Scenarios

Normal Usage

.

Post-Condition

Sequence Diagram

## Appendix: Reference Documents

|  |  |
| --- | --- |
| Reference # | Document Title |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
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