Software Requirement Specifications

**Communication Protocol Emulation**

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# **Document Details**

* 1. **Revision History**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version#** | **Date** | **Details of change** | **Author** | **Reviewers** |
| *E.g.* | *E.g.* |  |  |  |
| *Draft 0.1* | *1-Sep-2013* |  |  |  |

* 1. **Document Approver**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Version#** | **Date** | **Remark** |
|  | *E.g.* | *E.g.* | *If approval is in email must be provided in reference here. And its date will be considered as approval date.* |
|  | *Version which is approved by customer* | *1-Sep-2013* |  |

* 1. **Acronyms & Abbreviation**

|  |  |  |
| --- | --- | --- |
| **Sr.** | **Term** | **Description** |
| 1 | RFQ | Request For Quotation |
| 2 | RD | Requirement Document |

* 1. **Reference**

|  |  |  |
| --- | --- | --- |
| **Reference Document Title** | **Provided by** | **Remarks** |
| *<$RFQ of Product/Project>* | *<$customer/consulting person name>* |  |
| *<$RD of Product/Project>* | *<$customer/consulting person name>* |  |
| *<$Or any email>* | *<$customer/consulting person name>* |  |

* 1. **Document Conventions**

This section gives more clarity about the conventions used in this document.

* + 1. **Terms Used**

Note that the force of these words is modified by the requirement level of the document in which they are used.

**MUST:** This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification.

**MUST NOT:** This phrase, or the phrase "SHALL NOT", mean that the definition is an absolute prohibition of the specification.

**SHOULD:** This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.

**SHOULD NOT:** This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.

* + 1. **Requirement Marking**

The use of the word “shall” indicates a requirement that must meet. Each requirement is further identified with a label in the form of **SR-n** where:

* **SR** signifies “Software Requirement”
* **n** is a number unique to a requirement. Each requirement is identified and tracked with this number in the all documents throughout project life cycle.
  + 1. **Note**

A requirement may include an explanation of the requirement or the interaction between requirements, or other information useful in determining the intent of the requirement. The note, however, is not part of the requirement. Notes are indicated by the prefix “Note”, by verbs other than “shall,” or by enclosure in parentheses.

* + 1. **TBD and TBR Markers**

‘TBD’ indicates ‘To Be Determined’ or ‘To Be Defined’ and ‘TBR’ indicated ‘To Be Revised’ requirements or parts that have yet to be fully defined. TBD indications may be used during the initial writing of the SRS, but **all** TBDs must be resolved and the TBD indication removed **before** the document is baselined and submitted for approval. <Client> will resolve all TBD markers before starting the design phase.

# **Introduction**

This project will simulate a scenario in which the set and get commands are sent from a mobile (User input on terminal in our case) and get appropriate response from the device (response will be generated from the users system in our case) in BLE command frame (TLV) format. In short this product will be a TLV frame emulator.

## **Purpose**

The Software Requirements Specifications (SRS) describes the detailed requirements for the software (e.g. firmware, cloud, application, BSP) design of TLV Frame Emulator based on scope of work defined for this project. This document will be baselined and signed-off after review with *<$client name>*. Once baselined and signed-off, it can be updated with changes incurred during project execution, following change management process.

## **Scope**

The SRS includes functional and non-functional requirements of the system for software, Quality assurance and UI/UX design. These requirements form the basis for all project work. This document will be referred by software, firmware, design and test teams to develop and validate the software. The intended audience includes Managers, Engineers, Testers, and others who need to understand and implement the product functionality.

# **Scope of work**

Users will need to manually enter the BLE command frame (TLV) on the terminal acting as a mobile device. Device response will be simulated by the users system only. No real device will be used.

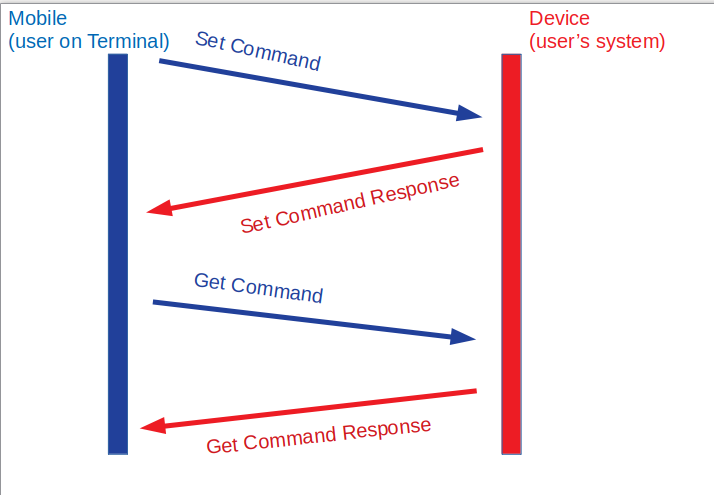
## **Out of Scope**

Sending BLE command frame (TLV) via bluetooth from mobile to device or vice versa. Not using real mobile or devices. Any Kind of work related to hardware.

# **System Overview**

Users will need to manually enter the BLE command frame (TLV) on the terminal acting as a mobile device. Device response will be simulated by the users system only.

A TLV frame from the terminal will be sent to the system for set or get command then an appropriate response will be generated in the TLV structure itself in the users system and will be sent as a response to the user on the terminal.



# **System Requirements**

|  |  |
| --- | --- |
| **Req. ID** | **Requirement description** |
| SR\_1 | A system running Linux and users having access to it’s terminal. |
| SR\_# |  |

# **Operating Requirements**

<https://docs.google.com/spreadsheets/d/1pzxfNKXy5IvzlAr3qAIGLzeM3TbeGvob/edit#gid=259112245>

# 7 **Functional Requirements**

This is where we mention the items from SOW. You can make sub-sections for different teams like software, power, firmware, upgrade, etc.

All Requirement to be numbered in sequence.

### 7.1.1 **Functional Requirements**

|  |  |
| --- | --- |
| **Req. ID** | **Requirement description** |
| SR\_2 | Program should handle invalid input and should not crash if any invalid input is received. |
| SR\_3 | Program should also carry out range validation for the value in the received valid tlv frame. |
| SR\_4 | Program should store values received in TLV frame in proper structures for further use. |
| SR\_5 | Emulator Shall be Able to Generate appropriate response as per (set/get) Advertising Configuration Group TLV Frame |
| SR\_6 | Emulator Shall be Able to Generate appropriate response as per (set/get) Advertising Timeout Group TLV Frame |
| SR\_7 | Emulator Shall be Able to Generate appropriate response as per (set/get) Accelerometer Configuration Group TLV Frame |
| SR\_8 | Emulator Shall be Able to Generate appropriate response as per (set/get) Device Configuration Group TLV Frame |
| SR\_9 | Emulator Shall be Able to Generate appropriate response as per (set/get) Impact Configuration Group TLV Frame |
| SR\_10 | Emulator Shall be Able to Generate appropriate response as per (set/get) HIE configuration Group TLV Frame |
| SR\_11 | Emulator Shall be Able to Generate appropriate response as per (set/get) Advertising Configuration Group TLV Frame |
| SR\_12 | Emulator Shall be Able to Parse Advertising Timeout Group TLV Frame |
| SR\_13 | Emulator Shall be Able to Parse Accelerometer Configuration Group TLV Frame |
| SR\_14 | Emulator Shall be Able to Parse Device Configuration Group TLV Frame |
| SR\_15 | Emulator Shall be Able to Parse Impact Configuration Group TLV Frame |
| SR\_16 | Emulator Shall be Able to Parse HIE configuration Group TLV Frame |
| SR\_17 | Emulator Shall be Able to Parse Normal advertising frequency Single TLV Frame |
| SR\_18 | Emulator Shall be Able to Parse Check In advertising frequency Single TLV Frame |
| SR\_19 | Emulator Shall be Able to Parse HIE advertising frequency Single TLV Frame |
| SR\_20 | Emulator Shall be Able to Parse Alert advertising frequency Single TLV Frame |
| SR\_21 | Emulator Shall be Able to Parse Normal advertising timeout Single TLV Frame |
| SR\_22 | Emulator Shall be Able to Parse Check In advertising timeout Single TLV Frame |
| SR\_23 | Emulator Shall be Able to Parse HIE advertising timeout Single TLV Frame |
| SR\_24 | Emulator Shall be Able to Parse Alert advertising timeout Single TLV Frame |
| SR\_25 | Emulator Shall be Able to Parse Accelerometer scale Single TLV Frame |
| SR\_26 | Emulator Shall be Able to Parse Accelerometer Wakeup Threshold Single TLV Frame |
| SR\_27 | Emulator Shall be Able to Parse Emfit Sensing Threshold Single TLV Frame |
| SR\_28 | Emulator Shall be Able to Parse Emfit Sample Rate Single TLV Frame |
| SR\_29 | Emulator Shall be Able to Parse Emfit Total Sample Single TLV Frame |
| SR\_30 | Emulator Shall be Able to Parse Check in interval Single TLV Frame |
| SR\_31 | Emulator Shall be Able to Parse Inactive Timeout Single TLV Frame |
| SR\_32 | Emulator Shall be Able to Parse HIE Queue size Single TLV Frame |
| SR\_33 | Emulator Shall be Able to Parse HIE Threshold Single TLV Frame |
| SR\_34 | Emulator Shall be Able to Parse HIE Timeout Single TLV Frame |
| SR\_35 | Emulator Shall be Able to Generate appropriate response as per (set/get) Normal advertising frequency Single TLV Frame |
| SR\_36 | Emulator Shall be Able to Generate appropriate response as per (set/get) Check In advertising frequency Single TLV Frame |
| SR\_37 | Emulator Shall be Able to Generate appropriate response as per (set/get) HIE advertising frequency Single TLV Frame |
| SR\_38 | Emulator Shall be Able to Generate appropriate response as per (set/get) Alert advertising frequency Single TLV Frame |
| SR\_39 | Emulator Shall be Able to Generate appropriate response as per (set/get) Normal advertising timeout Single TLV Frame |
| SR\_40 | Emulator Shall be Able to Generate appropriate response as per (set/get) Check In advertising timeout Single TLV Frame |
| SR\_41 | Emulator Shall be Able to Parse HIE advertising timeout Single TLV Frame |
| SR\_42 | Emulator Shall be Able to Generate appropriate response as per (set/get) Alert advertising timeout Single TLV Frame |
| SR\_43 | Emulator Shall be Able to Generate appropriate response as per (set/get) Accelerometer scale Single TLV Frame |
| SR\_44 | Emulator Shall be Able to Generate appropriate response as per (set/get) Accelerometer Wakeup Threshold Single TLV Frame |
| SR\_45 | Emulator Shall be Able to Generate appropriate response as per (set/get) Emfit Sensing Threshold Single TLV Frame |
| SR\_46 | Emulator Shall be Able to Generate appropriate response as per (set/get) Emfit Sample Rate Single TLV Frame |
| SR\_47 | Emulator Shall be Able to Generate appropriate response as per (set/get) Emfit Total Sample Single TLV Frame |
| SR\_48 | Emulator Shall be Able to Generate appropriate response as per (set/get) Check in interval Single TLV Frame |
| SR\_49 | Emulator Shall be Able to Generate appropriate response as per (set/get) Inactive Timeout Single TLV Frame |
| SR\_51 | Emulator Shall be Able to Generate appropriate response as per (set/get) HIE Queue size Single TLV Frame |
| SR\_52 | Emulator Shall be Able to Generate appropriate response as per (set/get) HIE Threshold Single TLV Frame |
| SR\_53 | Emulator Shall be Able to Generate appropriate response as per (set/get) HIE Timeout Single TLV Frame |

### 7.1.2 **Non Functional Requirements**

# Not Applicable

# 8 **Performance Requirements**

|  |  |
| --- | --- |
| **Req. ID** | **Requirement description** |
| SR\_54 | Program should run continuously as long as that particular terminal is running or the user has stopped the program. |
| SR\_# |  |

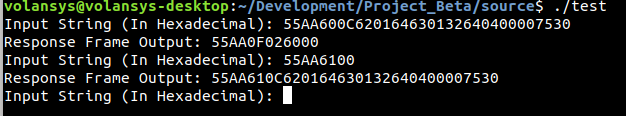
# 9 **Regulatory Compliance and Certification Requirements**

# Not Applicable

# 10 **External Interface Requirements**

# Not Applicable

## 10.1 **User Interface**

**

## 10.2 **Software Interface**

# Not Applicable

## 10.3 **Hardware interface**

# Not Applicable

## 10.4 **Communication interface**

All the actual communication happens over BLE between a BLE Device and a smartphone.

# 11 **Special Implementation Notes**

# Not Applicable

# 12 **Software System Attributes**

The following items provide a partial list of system attributes that can serve as requirements that should be objectively verified.

## 12.1 **Reliability**

# Not Applicable

## 12.2 **Availability**

# Not Applicable

## 12.3 **Security**

# Not Applicable

## 12.4 **Maintainability**

# Not Applicable

## 12.5 **Portability**

**Not Applicable**

# 13 **Acceptance Criteria**

Acceptance will be governed by meeting all requirements exclusively covered in this document. In general, following criteria applies to acceptance of *TLV Frame Emulator*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Configuration** | **Example Frames with Padding Bytes** | | | | | |
| Set Advertising Interval Group | 55AA101811040000133812040000E0601304000000641404000001F4 | | | | | |
| Get Advertising Interval Group | 55AA1100 | | | | | |
| Set Advertising Timeouts Group | 55AA201822040000133823040000E0602404000000642504000001F4 | | | | | |
| Get Advertising Timeouts Group | 55AA2100 | | | | | |
| Set Accelerometer Config Group | 55AA300632010833020190 | | | | | |
| Get Accelerometer Config Group | 55AA2100 | | | | | |
| Set HIE Config Group | 55AA600C620164639132640400007530 | | | | | |
| Get HIE Config Group | 55AA6100 | | | | | |
| Set General Device Config Group | 55AA500C52040000E06053040001D4C0 | | | | | |
| Get General Device Config Group | 55AA5100 | | | | | |
| Set Impact Config Group | 55AA400C420207D0430203E8440207D0 | | | | | |
| Get Impact Config Group | 55AA4100 | | | | | |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Configuration** | **Example Frames with Padding Bytes** | | | | | |
| **Set Normal Advertising interval** | 55AA120400001338 | | | | | |
| **Get Normal Advertising Interval** | 55AA1200 | | | | | |
| **Set Checkin Advertising interval** | 55AA130400001338 | | | | | |
| **Get Checkin Advertising Interval** | 55AA1300 | | | | | |
| **Set HIE Advertising interval** | 55AA140400001338 | | | | | |
| **Get HIE Advertising Interval** | 55AA1400 | | | | | |
| **Set Alert Advertising interval** | 55AA150400001338 | | | | | |
| **Get Alert Advertising Interval** | 55AA1500 | | | | | |
|  |  | | | | | |
| **Set Normal Advertising Timeout** | 55AA220400001338 | | | | | |
| **Get Normal Advertising Timeout** | 55AA2200 | | | | | |
| **Set Checkin Advertising Timeout** | 55AA230400001338 | | | | | |
| **Get Checkin Advertising Timeout** | 55AA2300 | | | | | |
| **Set HIE Advertising Timeout** | 55AA240400001338 | | | | | |
| **Get HIE Advertising Timeout** | 55AA2400 | | | | | |
| **Set Alert Advertising Timeout** | 55AA250400001338 | | | | | |
| **Get Alert Advertising Timeout** | 55AA2500 | | | | | |
|  |  | | | | | |
| **Set Accelerometer Scale** | 55AA320102 | | | | | |
| **Get Accelerometer Scale** | 55AA3200 | | | | | |
| **Set Accelerometer Wakeup Threshold** | 55AA3302190 | | | | | |
| **Get Accelerometer Wakeup Threshold** | 55AA3300 | | | | | |
|  |  | | | | | |
| **Set Emfit Sensor Threshold** | 55AA420207D0 | | | | | |
| **Get Emfit Sensor Threshold** | 55AA4200 | | | | | |
| **Set Emfit Samlping Frequency** | 55AA430203E8 | | | | | |
| **Get Emfit Sampling Frequency** | 55AA4300 | | | | | |
| **Set Emfit Sensor Samples** | 55AA440207D0 | | | | | |
| **Get Emfit Sensor Samples** | 55AA4400 | | | | | |
|  |  |  |  |  |  |  |
| **Set HIE Queue Size** | 55AA620164 | | | | | |
| **Get HIE Queue Size** | 55AA6200 | | | | | |
| **Set HIE Threshold** | 55AA630132 | | | | | |
| **Get HIE Threshold** | 55AA6300 | | | | | |
| **Set HIE Timeout** | 55AA640400001338 | | | | | |
| **Get HIE Timeout** | 55AA6400 | | | | | |
|  |  |  |  |  |  |  |
| **Set Inactivity Timeout** | 55AA520400001338 | | | | | |
| **Get Inactivity Timeout** | 55AA5200 | | | | | |
| **Set Checkin Interval** | 55AA530400001338 | | | | | |
| **Get Checking Interval** | 55AA5300 | | | | | |

# 14 **Change Management**

Requirement specifications once base-lined can only be updated by adhering to change management process; whereby all changes that need to be incorporated after baseline of SRS are candidate for impact analysis i.e. change of scope and its impact on overall project will be evaluated. An agreement to this effect between Volansys and *<$client name>* can be reached on effort, cost, schedule and related measurable parameters of project management.

# 15 **Assumptions, Dependencies, Risks & Constraints**

This section describes any assumptions and design constraints that are known at the time of signing-off the SRS document. These points will be tracked through implementation and may impact cost, timeline or quality of product.

## 15.1 **Assumptions**

# Not Applicable

## 15.2 **Dependencies**

# Not Applicable

## 15.3 **Risks**

# Not Applicable

## 15.4 **Known Constraints**

# Not Applicable

# 16 **Queries on Requirements**

# Not Applicable

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Security Classification** | | | Volansys Confidential | | |
| **Distribution** | | | Restricted | | |
| **Prepared By** | | | Engineering | | |
| **Maintained By** | | | SEPG | | |
| **Approved By** | | | Engineering Head | | |
| **Revision** | **Date** | **Details of Change** | **Author** | **Reviewer** | **Approver** |
| 0.1 | 14-Nov-17 | First draft | PA |  |  |
| 0.2 | 22-Nov-17 | Updated format and other change accepted | PA |  |  |
| 1.0 | 01-Feb-18 | Based lined from SEPG | SL | DS / RSR | Parthiv Shah |
| **1.1** | **31-Jul-19** | 1. **Company Logo has been updated** 2. **Spelling Error Corrected in Address & Baselined** | **Sandhya** | **Ravi** | **Dhaval** |
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