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| **Document Version** | ***DC Wall Box - Data Interface Engine – Design Document*** | ***Author*** |
| ***1.0*** | ***Pritam Pramanik***  ***(MS/PJ-ADV-PS)*** |

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| Overview *General overview of the project and its scope* |  |

### Project Purpose:

\*Short description of the project and its purpose\*

### Project Scope:

\*Generic information required to start the project. Eg.: the features the software needs to meet the stakeholder’s requirements\*

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| Design Topics and Functionality *Includes the Functionality of various topics of the Software, their behavior in Normal Operation and Other Cases* |  |

### Topic: Boot Up

* + 1. Normal Operation:
* Once DIE is up, it checks for CAN and GSM availability //logic for CAN and GSM availability check yet to be understood.
* Once Check are complete, DIE checks for the following values in the Configuration file: //The names of the values are yet to be decided
  + Maximum Allowed Input current from grid
  + Cost per kWh on grid
* Once Configuration Values are read, DIE goes to **Health Check**  
  + 1. Failure Case #1: CAN and GSM check is not successful
* DIE goes to **Wall Box Failure**
  + 1. Failure Case #2: Configuration Values not available
* DIE goes to **Missing Configuration**
  + 1. Failure Case #3: DIE does not boot up
* HMI waits till a timeout for MQTT message from DIE.
* If no message is received from DIE, HMI to display Wall Box Failure Page

### Topic: Health Check

* + 1. Normal Operation:
* When DIE goes to heath check, send the following MQTT topics to HMI:
  + PageName/AllPages:
    - <HealthIcon>: **No Icon**
    - <PlugStatus>: **Not Plugged**
    - <CloudConnection>: **Not Connected**
  + PageName/HealthCheck:
    - < CableCheckStatus>: **Checking**
    - <PowerBoardStatus>: **No Check**
    - <HeartBeatMsg>: **Checking**
* Check IMD digital output for 5s. IMD output is good. Send MQTT to HMI:
  + PageName/HealthCheck:
    - < CableCheckStatus>: **Good**
    - <PowerBoardStatus>: **Checking**
* Wait for 5s to receive v.SECC CAN frame
* Update the following signals and send CAN frame to CharCon
  + mc\_VCU\_OBCControl": <message counter value>,
  + VCU\_OBCMode\_Cmd": **standby**
  + VCU\_uDcReqChrgr": **0**
  + VCU\_iDcLimChrgr": **0**
  + VCU\_iAcMaxAllwdChrgr": <Value taken from Configuration>
  + CRC\_VCU\_OBCControl": <CRC logic yet to be understood>
* Wait for 5s max to receive Frame from CharCon
* Check the following signal to see that CharCon frame is received:
  + CHRGR\_stOperAct
* Once CAN frames are received from both v.SECC and CharCon, send MQTT to HMI:
  + PageName/HealthCheck:
    - <PowerBoardStatus>: **Good**
    - <HeartBeatMsg>: **Good**
* DIE goes to Home
  + 1. Failure Case #1: IMD output is Low
* DIE goes to **Wall Box Failure**
  + 1. Failure Case #2: No frames received from v.SECC
* DIE goes to **Wall Box Failure** 
  + 1. Failure Case #3: No frames received from charCon
* DIE goes to **Wall Box Failure**

### Topic: All Pages

* + 1. Normal Operation:
* When in this page
* Once Check are complete, DIE checks for the following values in the Configuration file: //The names of the values are yet to be decided
  + Maximum Allowed Input current from grid
  + Cost per kWh on grid
* Once Configuration Values are read, DIE goes to **Health Check**  
  + 1. Failure Case #1: CAN and GSM check is not successful
* DIE goes to **Wall Box Failure**

### Topic: Missing Configuration

* + 1. Normal Operation:
* AfterBoot up, if Configuration values are not found, this pace is displayed
* DIE sends the following MQTT topics to HMI. (No other topics are sent):
  + PageName/AllPages:
    - :<HealthIcon>: **White icon with exclamation**
    - <PlugStatus>: <Actual Status>
    - <CloudConnection>: <Actual Connection Status>
  + PageName/MissingConf //Actual Name yet to be agreed on

### Topic: Wall Box Failure

* + 1. Normal Operation:
* Whenever any software or hardware failure occurs, DIE comes to this mode.
* DIE sends the following MQTT topics to HMI. (No other topics are sent):
  + PageName/AllPages:
    - :<HealthIcon>: **Red icon with exclamation**
    - <PlugStatus>: <Actual Status>
    - <CloudConnection>: <Actual Connection Status>
  + PageName/Failure //Actual Name yet to be agreed on

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| References *Attachments / links for reference (optional)* |  |

1. \*Reference 1\*
2. \*Reference 2\*

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| Additional Comments *Additional Comments missed in the above fields* |  |