# 

Bin Format for Smart-Battery Firmware

Document Number: 00000

# Introduction

This document will describe in detail the formation of combined Bin file that will be created through Modbus Terminal and will be used to upgrade the Smart Battery (Cornell/Frey) firmware through Modbus Terminal.

# File Format

Modbus Terminal will take Certificate, MCU image and Service Pack and will form a combined **BIN** file which will be used for programing the smart battery. Here is the visual description of how it would look like.

|  |
| --- |
| **Main Header** |
| **1st File:**   |  |  | | --- | --- | | **File Header** | | | **Payload** | **Descriptor/Signature** | |
| **2nd File:**   |  |  | | --- | --- | | **File Header** | | | **Payload** | **Descriptor/Signature** | |
| **3rd File:**   |  |  | | --- | --- | | **File Header** | | | **Payload** | **Descriptor/Signature** | |

# Description:

Here is the description of the formats that will be used in creating the combined bin file

## Main Header:

This is the main header containing all the general information of the bin file. It will be comprised of the following elements:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Identification | Battery Type | File Count | Total Length | Total CRC | Header CRC |
| 2-Bytes | 1-Byte | 1-Byte | 4-Byte | 4-Byte | 4-Byte |

* **Identification :**  **“MH”** will be used as the identification bytes for main header.
* **Battery Type :** Type of smart battery attached(WiFi or Cellular)
* **File Count :** Total number of files present in the combined bin file.
* **Total Length :** Total number of bytes in whole file excluding main header.
* **Total CRC :** 32-Bit CRC of the whole file excluding main header.
* **Header CRC :** 32-Bit CRC of the main header packet.

## File Header:

This is the file header containing all the specific information of the particular file. It will be comprised of the following elements:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Identification | File Type | File Size | Signature Type | Signature Size | Header CRC |
| 2-Bytes | 1-Byte | 4-Bytes | 1-Byte | 2-Bytes | 4-Bytes |

* **Identification : “FH”** will be used as the identification bytes for file header.
* **File Type :** Type of thefile (MCU image, Certificate and Service pack).
* **File Size :** Size of the file (Payload only).
* **Signature Type :** Type of the signature (Descriptor or RSA).
* **Signature Size :** Size of the (Descriptor/Signature).
* **Header CRC :** 32-Bit CRC of the file header packet.

**Notes:**

File Type:

|  |  |
| --- | --- |
| Value | Definition |
| 0 | Unknown |
| 1 | Main Firmware |
| 2 | CA Certificate |
| 3 | Hash Key |
| 4 | Service Pack |

Signature Type:

|  |  |
| --- | --- |
| Value | Definition |
| 0 | Unknown |
| 1 | Descriptor |
| 2 | RSA |

## Payload:

This is the data packet of the file specified in file header. It will be of type and length specified in file header.

## Signature/Descriptor:

This is the file’s Descriptor or Signature (Key), it will be used for verification of the file itself.

1. In case of Descriptor its format will be:

|  |  |  |  |
| --- | --- | --- | --- |
| Identification | File CRC | File Not CRC | Start Address |
| 2-Bytes | 4-Byte | 4-Bytes | 4-Byte |

* **Identification : “DS”** will be used as the identification bytes for Signature/Descriptor Packet.
* **File CRC :** 32-Bit CRC of the file.
* **File Not CRC :** Not of 32-Bit CRC of the file.
* **Start Address :** Start address where this file will be written in Flash memory.

1. In case of Signature its format will be:

|  |  |
| --- | --- |
| Identification | Signature (Key) |
| 2-Bytes | 256-Byte |

* **Identification : “DS”** will be used as the identification bytes for Signature/Descriptor Packet.
* **Signature (Key) :** This is the Signature key of the file.