BPM Message

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Byte 0** | **Byte 1** | **Byte 2** | **Byte 3** | **Byte 4** | **Byte 5** |
| Message ID | Data 0 | Data 1 | Data 2 | Data 3 | CRC |

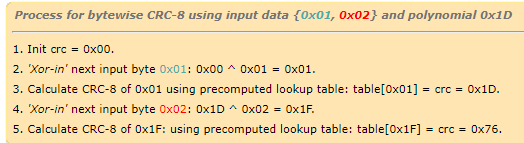
Full Message to Send over HIDAPI

|  |  |  |  |
| --- | --- | --- | --- |
| **Report #** | **STX** | **BPM Message** | **ETX** |
| 0x00 | 0x02 | 6 bytes of data | 0x03 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Byte 0** | **Byte 1** | **Byte 2** | **Byte 3** | **Byte 4** | **Byte 5** | **Byte 6** | **Byte 7** | **Byte 8** |
| Report (0x00) | STX (0x02) | Message ID | Data 0 | Data 1 | Data 2 | Data 3 | CRC | ETX (0x03) |

# CRC8

http://www.sunshine2k.de/articles/coding/crc/understanding\_crc.html



Poly used by onyx = x^8 + x^2 + x^1 + x^0 (1 0000 0111)

# Message ID Types

|  |  |
| --- | --- |
| **Message Type** | **Message ID** |
| Command | 0x11 |
| Reset | 0x10 |
| Ack | 0x06 |
| Nack | 0x15 |
| Button | 0x55 |
| Notification | 0x21 |
| Data | 0x41, 0x42, 0x43, 0x44, 0x49, 0x4C, 0x50, 0x52, 0x53 or 0x54 |

# Commands

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Msg ID** | **Data 0** | **Data 1** |
| Reset | 0x10 | 0xFF | --- |
| Handshake | 0x11 | 0x00 | --- |
| NIBP Stop | 0x01 | --- |
| NIBP Review | 0x02 | --- |
| NIBP Cycle | 0x03 | --- |
| NIBP Start | 0x04 | --- |
| NIBP Clear | 0x05 | --- |
| Disable Pressures | 0x08 | 0x01 |
| Enable Pressures | 0x08 | --- |
| Retrieve Last Result | 0x09 | --- |

# Acks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Msg ID** | **Data 0** | **Data 1** | **Data 2** | **Data 3** | **Notes** |
| Handshake | 0x06 | 0x00 | 100s column | 10s  column | 1s column | Get the firmware version.  Int: ((1)(2)(3))  String: ((1).(2)(3)) |
| Stop | 0x01 | --- | --- | --- |  |
| Review | 0x02 | Cycle time | Reading Number | Result Code |  |
| Cycle | 0x03 | Cycle time | --- | --- |  |
| Start | 0x04 | Cycle time | Reading Number | --- |  |
| Clear | 0x05 | --- | --- | --- |  |

# Buttons

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Msg ID** | **Data 0** | **Data 1** | **Data 2** | **Data 3** |
| Stopped | 0x55 | 0x01 | --- | --- | --- |
| Review | 0x02 | Cycle time | Reading Number | Result Code |
| Cycled | 0x03 | Cycle time | --- | --- |
| Started | 0x04 | Cycle time | Reading Number | --- |
| Cleared | 0x05 | --- | --- | --- |

# Notifications

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Msg ID** | **Data 0** | **Data 1** | **Data 2** | **Data 3** | **Notes** |
| Reset | 0x21 | 0x08 | Is power up | --- | --- | Java: isPowerUp = (Data1 & 0x01) == 0; |

# Data Codes

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Msg ID** | **Data 0** | **Data 1** | **Data 2** | **Data 3** | **Notes** |
| BP Average | 0x41 | Count | SBP | DBP | Pulse |  |
| BP Result | 0x42 | Error  Type  +  System Error code | SBP  (Data  or  Error  Code) | DBP  (Data or Error  Code) | Pulse  (Data or Error  Code) | Errors: left byte determines error type (system, SBP, DBP or pulse). Right byte is for system error type if a system error occurred |
| Deflating Cuff Pressure | 0x44 | ls | ms | --- | --- | ls + ms for pressure |
| Inflating Cuff Pressure | 0x49 | ls | ms | --- | --- | ls + ms for pressure |
| Review | 0x52 | reading | SBP | DBP | Pulse | If reading == 0 its average |

# Determine Error Type

Onyx uses a mask to determine which error type it is (errorCode & 0x#0) == 0x#0

|  |  |
| --- | --- |
| **Error Type** | **Masked Hex Value** |
| System | 0x80 |
| SBP | 0x40 |
| DBP | 0x20 |
| Pulse | 0x10 |

# System Errors

|  |  |
| --- | --- |
| **Error Type** | **ID** |
| Too Few Pulses | 0x00 |
| Too Many Motion Artifacts | 0x01 |
| Over Pressure | 0x02 |
| Inflation Too Slow | 0x03 |
| Inflation Too Fast | 0x04 |
| Deflation Too Slow | 0x05 |
| Deflation Too Fast | 0x06 |
| Software Fault | 0x07 |
| Pulse Amplitude too low | 0x08 |
| Pressure below minus 10 | 0x09 |
| Pressure too high for too long | 0x0A |
| Pressure not low enough for too long | 0x0B |
| STAM LTAM Violation | 0x0C |
| Reset by means other than power up | 0x0D |
| Reset by other means than power recovery data corrupted | 0x0E |
| Battery too low | 0x0F |
| Unknown | 0xFF |

# SBP/DBP/Pulse Errors

|  |  |  |  |
| --- | --- | --- | --- |
| **Error** | **SBP** | **DBP** | **Pulse** |
| Indeterminate | 0x14 | 0x15 | 0x16 |
| Under Range | 0x17 | 0x18 | --- |
| Over Range | 0x19 | 0x20 | --- |
| Arithmetic Error | 0x21 | 0x21 | 0x21 |
| Unknown | Any not listed above | Any not listed above | Any not listed above |