CONTEC CMS50 Pulse Oximeter Communication Protocols for real-time data

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# Description

This protocol has been designed to communicate with Contec CMS-50H Pulse Oximeter to collect Real-time data from the device.

# Communication directions

The device performs two-way communication, and all the data stream sharing should be initiated by the PC software.

# Communication description

* Communication: Serial (using USB)
* Baud rate: 115200
* Datastream type: string
* Data bit format: start bytes(2), Data bytes + un-used (7)
* Standard communication byte length: Nine (9)

# Communication method

1. PC software / Application must send initial commands to the device to initiate communication with the CMS-50h device.
2. The device responds to the commands starting with 0X7D 0X81 (start byte) followed by any set of **CODE** to receive the response of the device, all un-used bytes should be set to 0x80 to complete the Nine (9) bytes of the command.

**For example:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x7D | 0X81 | 0XA1 | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 |
| start bytes | | **CODE** | un-used bytes | | | | | |

|  |  |  |
| --- | --- | --- |
| **CODE** | **Meaning** | **Response start byte** |
| 0XA1 | Send real-time data of pulse oximeter | 0x01 |
| 0XA2 | Stop sending real-time data | 0x0C |
| 0XA6 | Ask for storage data | **0x09** or 0x0F |
| 0XA7 | Stop sending storage data | 0x0C |
| 0XA8 | -- | 0x02 |
| 0XA9 | -- | 0x03 |
| 0XAA | Ask for device identifiers | 0x04 |
| 0XAB | Ask for user info | 0x05 |

1. The device response starts with any response type provided with the CODE, and the response bytes vary with the response type.

**For example:**

To receive the real-time data from the device, send the following command.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x7D | 0X81 | 0XA1 | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 | 0x80 |
| start bytes | | **CODE** | un-used bytes | | | | | |

The response received can be interpreted using the following table.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x01 | 0x80 | Data 1 | Data 2 | Data 3 | Data 4 | Data 5 | Data 6 | Data 7 |

Real-time data package interpretation of CMS-50h

|  |  |  |
| --- | --- | --- |
| **Byte** | **Hex** | **Data / Remarks** |
| 0 | 0x01 | Response to the command: Send real-time data of pulse oximeter, HR, pulse wave, heartbeats, and PI from device to PC using serial communication |
| 1 | 0x80 |
| 2 | Data 1 | Bargraph data. Subtract a baseline **“128”** from the received decimal data. |
| 3 | Data 2 | Pulse waveform data. Subtract a baseline **“128”** from the received decimal data. |
| 4 | Data 3 | Heartbeat data: Subtract a baseline **“128”** from the received decimal data |
| 5 | Data 4 | Heart rate data: Subtract a baseline **“128”** from the received decimal data and the resultant value is the heart rate. |
| 6 | Data 5 | Spo2 data: Subtract a baseline **“128”** from the received decimal data and the resultant value is the Spo2 value in percentage. |
| 7 | Data 6 | The low byte of PI, divide by 100 |
| 8 | Data 7 | Hi byte of PI, divide by 100 and add both, PI = Data 6 + Data 7. |

# LABVIEW vi for real-time data retrieval from contec CMS-50H pulse oximeter.

A picture containing diagram

Description automatically generated

Graphical user interface, chart

Description automatically generated