### Command list

The commands are used to control the state of the system in to send information to it; they are summarized in Table X.

|  |  |  |
| --- | --- | --- |
| **Code** | **Name** | **Description** |
| 0x01 | CMD\_SHUTDOWN | Shutdown the system |
| 0x02 | CMD\_STATE | Get/Set the state of the system |
| 0x03 | CMD\_RESTART | Restart the system |
| 0x04 | CMD\_DATE | Set/get the date |
| 0x05 | CMD\_START\_LOG | Start a new log session |
| 0x06 | CMD\_STOP\_LOG | Stop the current log session |
| *Table X. Command list* | | |

#### CMD\_SHUTDOWN (0x01) – W

The system can be shut down by issuing the command 0x01 in write mode. The system will return an ACK\_SUCCESS (0x00) or ACK\_ERROR (0x01). In case of success, after 2 seconds from the reception of the command, the system is shut down and any Bluetooth connection will be lost.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | |  |  | |
|  |  | **R/W** | **ID** |  |  | |
| Master | **CMD** | 0 | 0x01 | 0x01 | - | - | 🡪 | | Slave | |
| **ACK** | 0 | 0x00 | 0x02 | 0x01 | ACK\_TYPE | 🡨 | |

#### CMD\_STATE (0x02) – R/W

The state of the system can be get or set by means of the command ID 0x02. To get the state of the system, the command 0x82 must be issued with 0x00 as length and no payload. In case of ACK\_SUCCESS, the payload length will be 3 bytes. The third byte carries information about the state of the system. In case of ACK\_ERROR, the payload length is 2 bytes.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | | |  |  |
|  |  | **R/W** | **ID** |  |  |
| Master | **CMD** | 1 | 0x02 | 0x00 | - | - | - | 🡪 | Slave |
| **ACK** | 0 | 0x00 | 0x03 | 0x82 | ACK\_TYPE | STATE | 🡨 |

To set the state of the system, the command 0x02 must be issued with 0x01 as length and with the code of the state as payload.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | |  |  | |
|  |  | **R/W** | **ID** |  |  | |
| Master | **CMD** | 0 | 0x02 | 0x01 | STATE | - | 🡪 | | Slave | |
| **ACK** | 0 | 0x00 | 0x02 | 0x02 | ACK\_TYPE | 🡨 | |

The list of the possible states is depicted in Table X.

|  |  |  |
| --- | --- | --- |
| **Code** | **Name** | **Description** |
| 0x00 | SYSTEM\_STATE\_STARTUP | Startup |
| 0x01 | SYSTEM\_STATE\_INIT | System initialization |
| 0x10 | SYSTEM\_STATE\_IDLE | System in IDLE state |
| 0x14 | SYSTEM\_STATE\_IDLE\_CONNECTED | System in IDLE state w/ active BT connection |
| 0x17 | SYSTEM\_STATE\_SLEEP | Sleep |
| 0x20 | SYSTEM\_STATE\_LOG | System logging data |
| 0xFF | SYSTEM\_STATE\_ERROR | Error state |
| *Table X. System states* | | |

#### CMD\_RESTART (0x03) – W

The system can be restarted by means of the command code 0x03. The system will return an ACK\_SUCCESS (0x00) or ACK\_ERROR (0x01). In case of success, after 2 seconds from the reception of the command the system is restarted, and any Bluetooth connection will be lost.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | |  | |  | |
|  |  | **R/W** | **ID** |  | |  | |
| Master | **CMD** | 0 | 0x03 | 0x00 | - | - | 🡪 | Slave | |
| **ACK** | 0 | 0x00 | 0x02 | 0x02 | ACK\_TYPE | 🡨 |

#### CMD\_DATE (0x04) – R/W

The epoch can be get or set through the command code 0x04. To set the date a command 0x04 must be issued with payload length of 0x04 and with payload the epoch represented with a 32-bit signed integer, MSB first. The system will return an ACK\_SUCCESS (0x00) or ACK\_ERROR (0x01).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | | | |  |  |
|  |  | **R/W** | **ID** |  |  |
| Master | **CMD** | 0 | 0x04 | 0x04 | TIMESTAMP | | | | 🡪 | Slave |
| **ACK** | 0 | 0x00 | 0x02 | 0x04 | ACK\_TYPE | - | - | 🡨 |  |

To get the date a command 0x84 must be issued with 0x00 as payload length. The system will return an ACK\_SUCCESS (0x00) or ACK\_ERROR (0x01). In case of success, the payload length will be 0x06 bytes and the payload will be the timestamp represented by means of a 32-bit signed integer, MSB first.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | | | | | |  | |  | |
|  |  | **R/W** | **ID** |  | |  | |
| Master | **CMD** | 1 | 0x04 | 0x00 | - | - | - | - | - | - | 🡪 | Slave | |
| **ACK** | 0 | 0x00 | 0x06 | 0x84 | ACK\_TYPE | TIMESTAMP | | | | 🡨 |

#### CMD\_START\_LOG (0x05) – W

A log session can be started by means of the command ID 0x05. To start the session, the command 0x05 must be issued with length 0x02 and payload.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | | |  | |  | |
|  |  | **R/W** | **ID** |  | |  | |
| Master | **CMD** | 0 | 0x05 | 0x03 | SENSORS | FREQUENCY | | 🡪 | Slave | |
| **ACK** | 0 | 0x00 | 0x02 | 0x05 | ACK\_TYPE | - | 🡨 |

* SENSORS (1 byte). By means of this byte, it is possible to select the sensors to use during the current log session. By setting a specific bit to 1, the correspondent sensor is selected.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SENSORS byte** | | | | | | | |
| - | - | - | PRESS | HUM | TEMP | GYRO | AXL |

* FREQUENCY (2 byte). The nominal acquisition frequency.

|  |
| --- |
| **Note:** The acquisition procedure is carried out using the SysTick timebase. In order to have an accurate acquisition frequency, the frequency should be a divider of 1000. |

#### CMD\_STOP\_LOG (0x06) – W

A log session can be stopped by means of the command ID 0x06.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **COMMAND** | | **LENGTH** | **PAYLOAD** | |  | |  | |
|  |  | **R/W** | **ID** |  | |  | |
| Master | **CMD** | 0 | 0x06 | 0x00 | - | - | 🡪 | Slave | |
| **ACK** | 0 | 0x00 | 0x02 | 0x06 | ACK\_TYPE | 🡨 |