# VR-Crosswalk

## Communication protocol between VR-Crosswalk and host computer.

The device *VR-Crosswalk* can tell the host computer where the foots of the operator are located, in which angle each foot is currently orientated and the current state of the device.

The communication between VR-Crosswalk and the host computer is using Bluetooth. The communication speed is 38400 baud, 8 data bits. There is no need to select stop-bit or parity, it doesn’t matter. The host must look for the Bluetooth device “*VR-Crosswalk*”, connect to it and the Bluetooth connection can be handled as a normal COM port (RS232). The PIN, to connect to the device, is by default: **1234**

Once the connection is established, and the host is listening on the COM port, the device will send its current state, each foot location and orientation by itself as soon as a foot has moved.

The host computer can also ask the device to move any axis. But in this case, it is forbitten for the operator to use the device. If host send a move command, but an operator is detected by the device, the command is rejected. For safety reason, each axis movement will be performed in very slow speed.

The communication between host and VR-Crosswalk is done by using 6 bytes data packages. Every data package is 6 bytes long. There are up to looks like this:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1.Byte | 2.Byte | 3.Byte | 4.Byte | 5.Byte | 6.Byte |
| Message ID | Value #1 (8 Bits) | Value #2 (8 Bits) | Value #3 (8 Bits) | Value #4 (8 Bits) | Checksum |
| Message ID | Value #1 (16 Bits, signed INT) | | Value #2 (16 Bits, signed int) | | Checksum |
| Message ID | Value #1 (32 Bits, signed long) | | | | Checksum |
| Message ID | Value #1 (32 bits as float) | | | | Checksum |

The checksum is an XOR operation of the first five bytes.

Commands from host to VR-Crosswalk

Rotate device

This command, send by host, will rotate the VR-Crosswalk by the given value in units. This movement is relative. So, if you want to rotate the device by 200 units from the current position, set for Value #1 the number 200.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1.Byte | 2.Byte | 3.Byte | 4.Byte | 5.Byte | 6.Byte |
| Message ID | Value #1 (32 Bits as signed long) | | | | Checksum |
| 0x10 | any positive or negative number | | | | Checksum |

### Current state

The current state is sent from VR-Crosswalk to the host computer every 0,1 seconds. The state is four bytes long. Its value is defined as:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Byte** | **1** | | | | | | | | **2** | | | | | | | | **3** | | | | | | | | **4** |
| **Bit** | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | CRC |
|  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

* Byte 2, Bit 7:

### Left Foot location, X-Coordinate

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Byte** | **1** | | | | | | | | **2** | **3** | **4** |
| **Bit** | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Lowbyte | Highbyte | CRC |
|  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | X-Coordinate in 0,1mm | X-Coordinate in 0,1mm |  |