



cinemizer headtracker product description

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cinemizer headtracker

The headtracker is an input device which records the head movements of the user, allowing natural and intuitive interaction. Different sensors detect changes in rotation in all three dimensions and transmit these to the computer. In combination with the cinemizer OLED multimedia glasses, this allows users an immersive virtual reality experience by intuitively looking around.

Description

The cinemizer headtracker acts like a PC mouse, making it suitable for all games and professional applications that can be operated with a computer mouse. The headtracker is attached to the right temple of the video glasses.

When using the cinemizer headtracker, there is no specific driver needed so it can be immediately used on Windows, Apple and Linux operating systems.

Details

The headtracker can be used in 3 different modes.

- 1) standard PC mouse (default)
- 2) access the pre-calculated Quaternion-data supplied through a second HID-interface
- 3) access the orientation data (raw data) supplied through a second HID-interface

The USB-HID Class drivers are supplied by all major operating systems allowing the Headtracker to be used in Windows®, MAC® or Linux environments.

Features

- Pre-calculated Quaternion Data
- No additional drivers needed
- Access to all raw sensor data via SDK or HID
- Compatible with Windows®, MAC® or Linux
- No integration needed for mouse emulation
- System independent adjustable mouse speed
- USB 2.0 compatible
- 200Hz sample rate
- Latency < 5ms
- +/- 16g Accelerometer range
- +/- 2000°/s Gyroscope range
- +/- 0.24 mg resolution
- +/- 0.06 °/s resolution
- 0.000061 Quaternion resolution

Application

- Virtual Reality Systems
- Virtual house tour (architecture)
- 360° panorama view (real estate, touristic)
- 3D-Gaming
- CAD-Environments
- FPV
- Input assistance
- ... many others ...

Calibration

The cinemizer headtracker is self-calibrating. As soon as power is supplied any gyroscope drift and accelerometer offset is calculated and compensated. This process may take up to 10 seconds. During this time it is essential, that the Tracker remains still. It is possible, that a visible cursor drift is present during this time. As soon as calibration is complete this drift disappears.

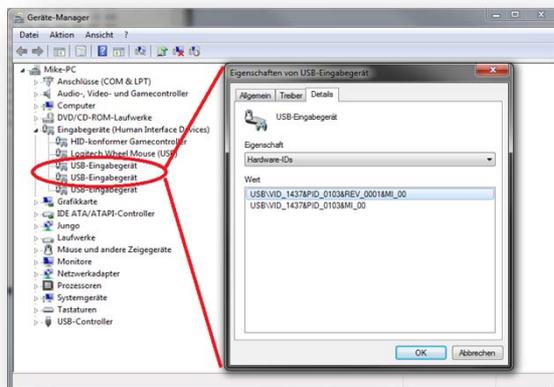
Anytime during use, if no movement is detected, the tracker will start its calibration routine in order to guarantee continuously calibrated Data.

Note that the raw data interfaces are not influenced by this calibration. Only the pre-calculated quaternions use the calibrated sensor data.

The Headtracker enumerates two HID-devices when connected to a Host
The corresponding VID and PID are:

- VID: 0x1437
- PID: 0x0103

Enumeration



Device one acts as a mouse. This is to allow users to use the Headtracker out of the box in a variety of Software such as first person games, where the mouse is used to control the viewport. This mouse interface may be disabled if not used.

The second device enumerates a HID-Game controller. This device is used to stream the raw data to the host. The report size including report-id of this device is 32 bytes.

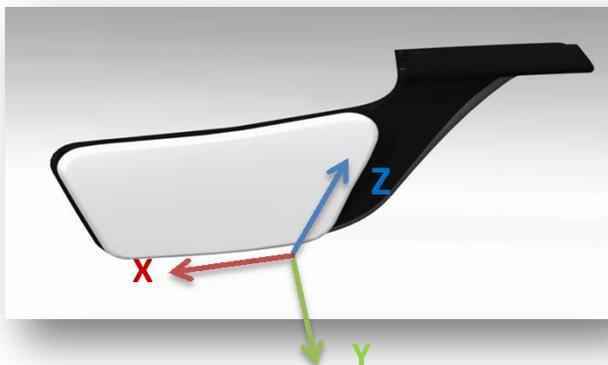
The available SDK should be used to access the Headtrackers data. Should this not be possible for any reasons the following is an overview of how the **raw data** is sent to the PC:

The raw data is sent to the host in reports of 31 Bytes containing the following components:

- Accelerometer (X-Y-Z) – 6 Bytes
- Gyroscope (X-Y-Z) – 6 Bytes
- Magnetometer (X-Y-Z) – 6 Bytes
- Quaternion (W-I-J-K) – 8 Bytes
- Internal status information – 5 Bytes

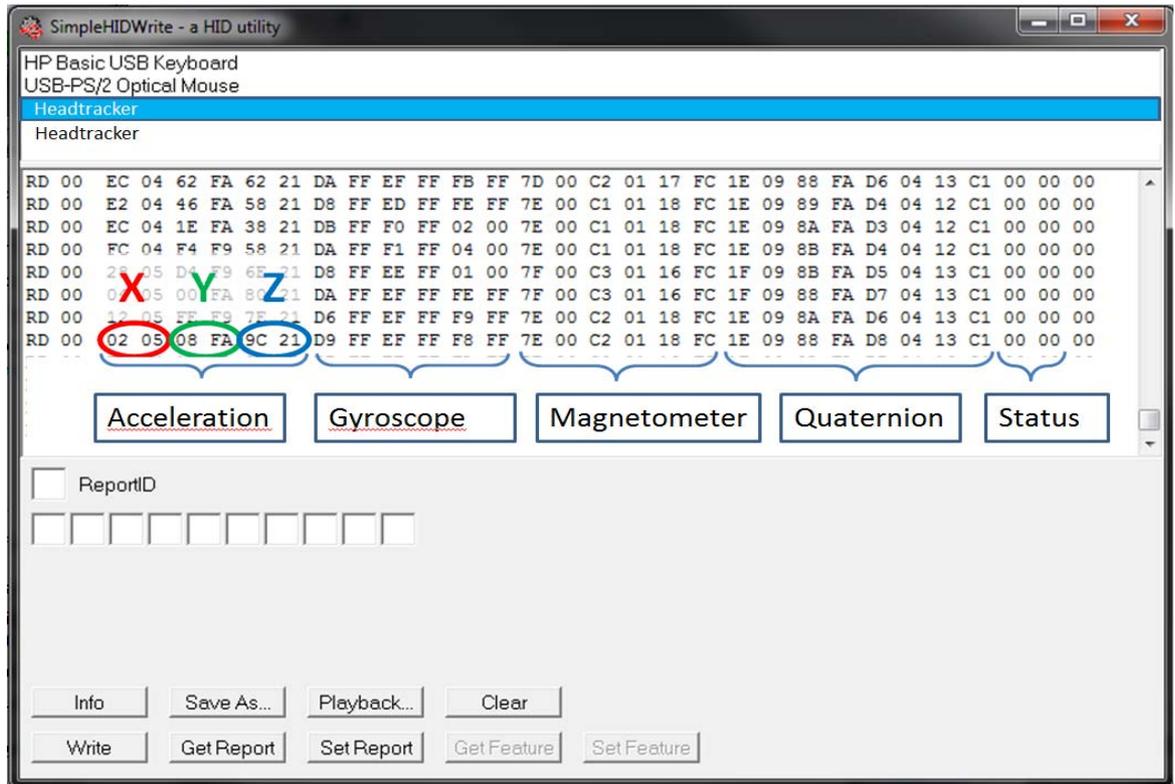
Note: The coordinates X-Y-Z are relative to the chip-coordinates and do not represent the cinemizer's coordinates. Further information on how to receive cinemizer oriented quaternions can be found in the SDK:

Receiving data



For each sensor and axis the raw data is received in two bytes. The first byte is the LSB and the second byte is the MSB. In order to get the correct values the code should look something like this:

```
short Acceleration_x = USB_report[0] + USB_report[1]*256;  
short Acceleration_y = USB_report[2] + USB_report[3]*256;  
short Acceleration_z = USB_report[4] + USB_report[5]*256;
```



Raw data details

You can send commands to the tracker using the standard HID interface. The report size is 10 bytes and ReportID must be 0x00. The first byte contains the command ID. The following 9 bytes contain the actual data.

Sending commands

The following commands are accepted by the tracker:
 Command ID Function Valid Values
 0x01 Set mouse speed* 0x00 – 0xFF
 0xFF Start Firmware upgrade mode**

* Mouse speed 0 disables the mouse movement via tracker

** Firmware upgrade mode disconnects the tracker and re-enumerates it as a new HID device.

WARNING: this should be used only in combination with a valid firmware flashing tool as it can render the tracker useless if used in incorrect manner!

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