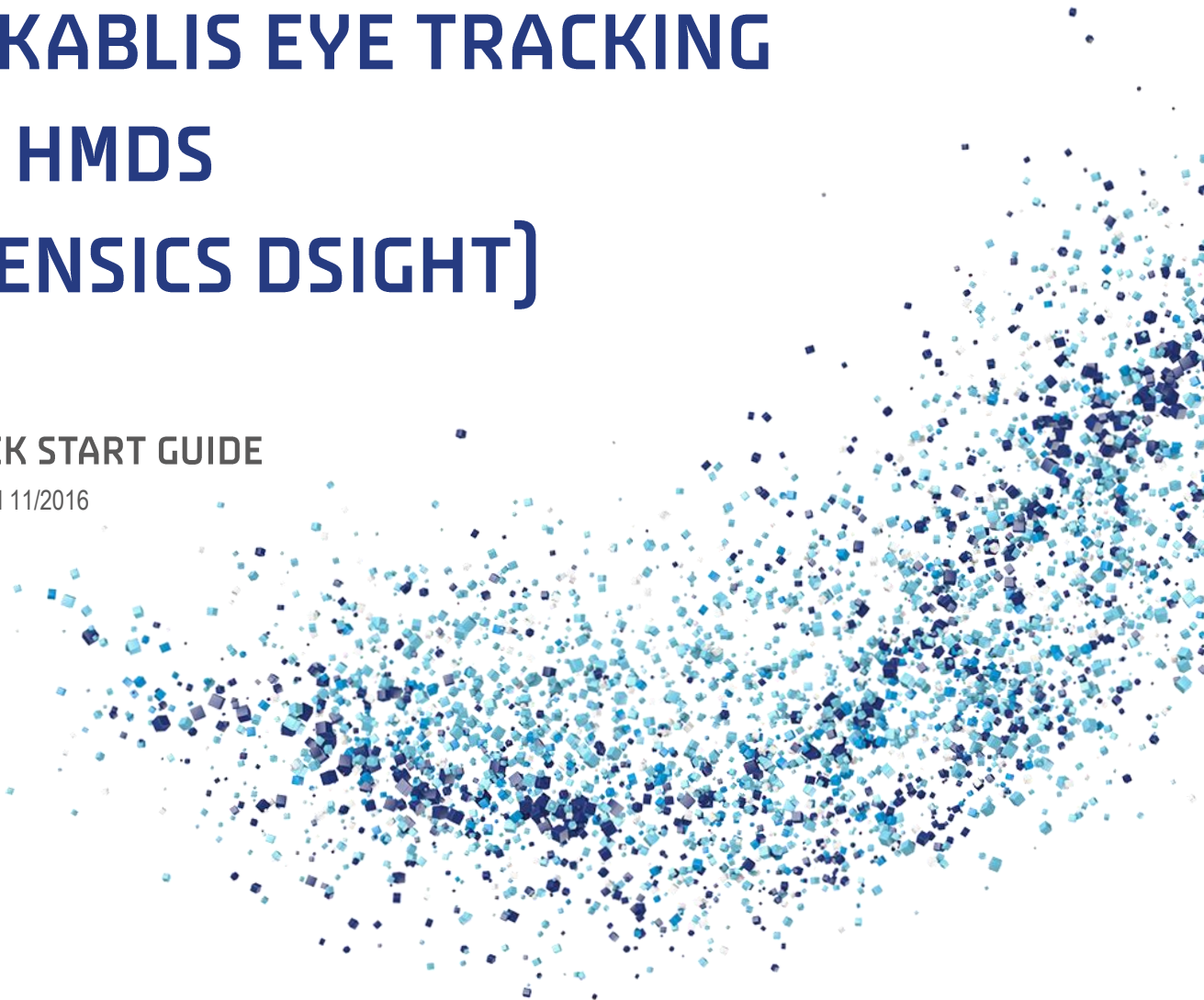
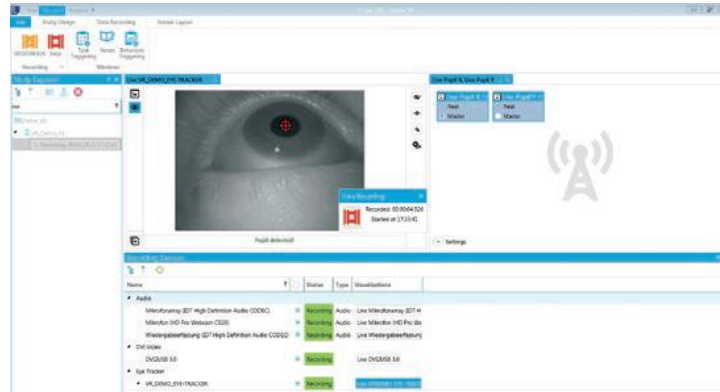


DIKABLIS EYE TRACKING IN HMDS (SENSICS DSIGHT)

QUICK START GUIDE

Updated 11/2016





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1. REQUIREMENTS

1.1. Hardware Requirements

Sensics dSight HMD incl. Power Supply Adapter



1x USB Mini to USB 2.0 Cable for Sensics Head-Tracking (Gyroscope)



USB Mini to USB for Dikablis Eye-Cameras (2x in case of binocular Eyetracker, 1x in case of monocular Eye-Tracking)



2x HDMI to Micro-HDMI Cables (Video input for HMD Displays)



Epiphan DVI2USB 3.0 Grabber



USB 3.0 B-Type to A-Type Cable



1x DVI to HDMI/DP/DVI Cable
(Epiphan grabber to Graphics PC)



Additional hardware in case of Setup option with HDMI Splitter

NOTE: Use this option of the graphics card of the Graphics PC provides only 2 outputs.

1:2 HDMI Splitter incl. Power Supply Adapter



1x HDMI/DP/DVI to HDMI Cables
(HDMI Splitter to Graphics PC)



1.2. Software Requirements

D-Lab PC

D-Lab 3.11 with Eye Tracking Head Mounted and Eye Tracking Virtual Reality License Dongle ([Download latest D-Lab here](#))

Install [Epiphan drivers](#)

VR PC

Driver Package from Sensics <https://ergoneers.hostedftp.com/CB2UYNahfwtKXooROYJsBxp5O>

Driver for your Gyro Sensor

- **Since October 2016:** Freespace MotionStudio <http://hillcrestlabs.com/products/tools/> (requires Java 7 Runtime environment)
- **Before October 2016:** 3Space Suite <https://yostlabs.com/yost-labs-3-space-sensor-software-suite/> (note the setup for WIN 10 on the very bottom)

Any modelling Software e.g. Unity or Vizard.

OSVR SDK. You will find more information on this [website](#).

Installation Guide for Graphics PC

1. Sensics combined driver package
2. Restart PC
3. In case the dSight HMD was produced after October 2016, install Java 7 Runtime Environment → Restart PC
4. Install drivers for Gyro sensor
5. Restart PC

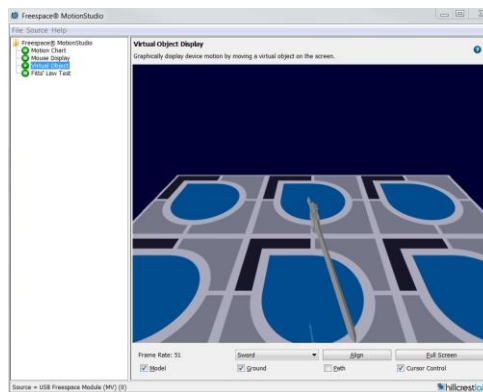
2. SET UP DSIGHT HMD WITH DIKABLIS EYE TRACKING

Start with this procedure step by step after installing software and drivers without having connected any cable to dSight HMD. Depending on how many outputs the graphics card of the VR PC has, choose the option without or with the HDMI splitter (see page 4)

#Step 1: Connect **HMD to power** and wait 30 seconds

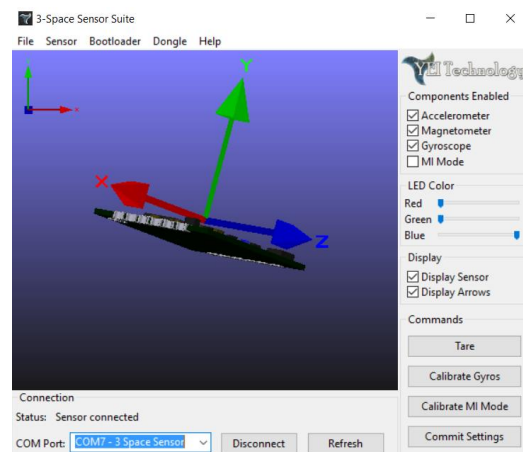
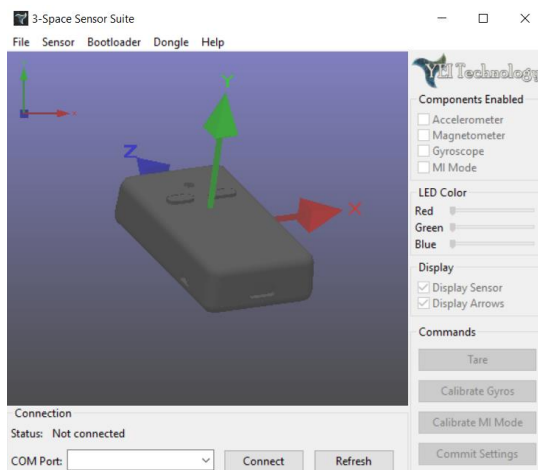
#Step 2: Connect **Gyroscope** (Mini USB to USB 2 cable) to **VR PC** and open the related driver tool (Freespace MotionStudio or 3Space Suite) → Move the HMD and check the visualized movement in the software → Close the software.

Gyro option 1 (Since October 2016)



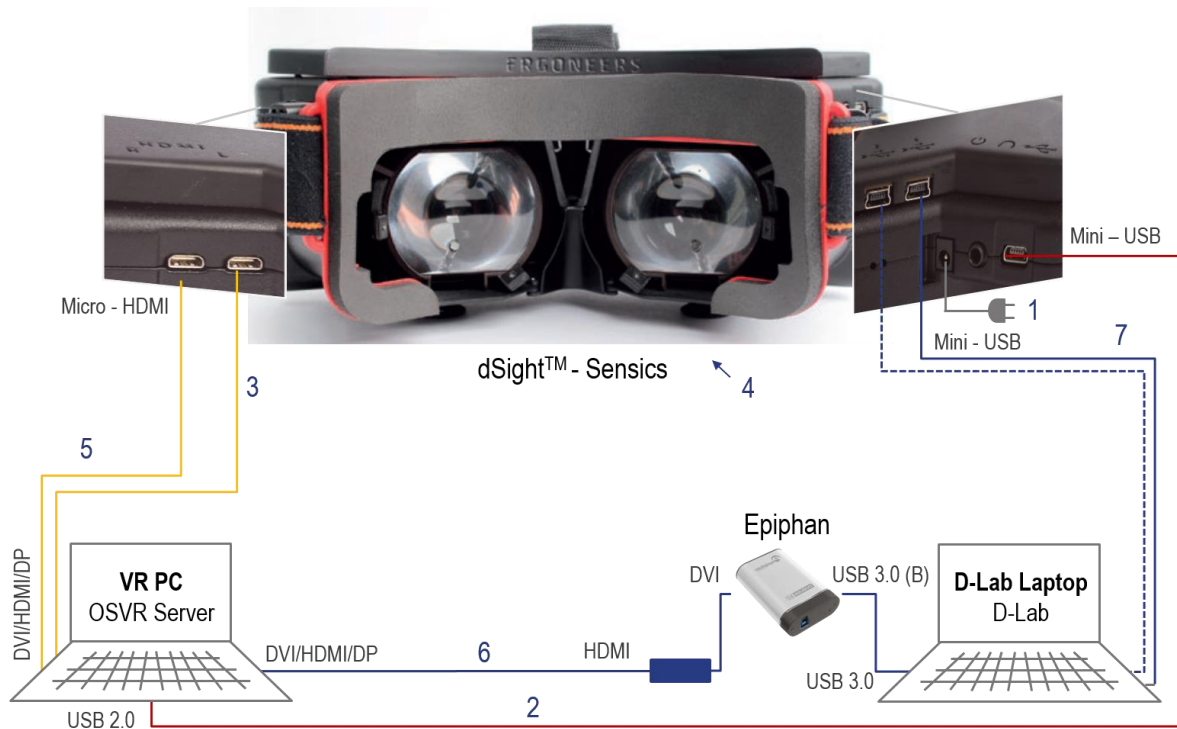
Gyro option 2 (Before October 2016)

With that option it is necessary to check the COM Number of the 3 Space Sensor in the Device manager and select it from the drop down menu on the bottom left.



CHOOSE BETWEEN SETUP OPTIONS HERE

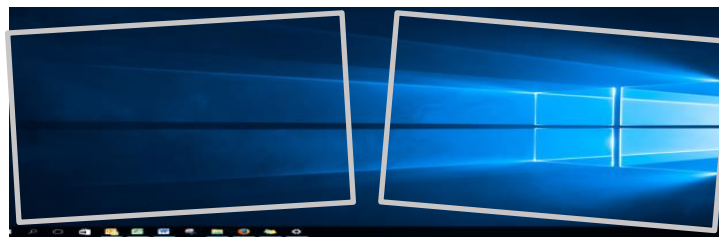
Option without HDMI Splitter (recommended)



Legend: **Video Data for Displays**, Mocular Eye Tracking, --- Binocular Eye Tracking, **Gyroscope**

#Step 3: Connect the **Left display** (HDMI to Micro HDMI) to the **VR PC**.

#Step 4: Check Display in HMD → Desktop should be visible spread over both displays.



NOTE: Displays settings in Windows might have to be changed to Extend to Display 1, Landscape and 1920x1080 resolution or go to Trouble Shooting.

#Step 5: Connect the **Right Display** (HDMI to Micro HDMI) to the VR PC → Desktop should be visible on left end right display separately.



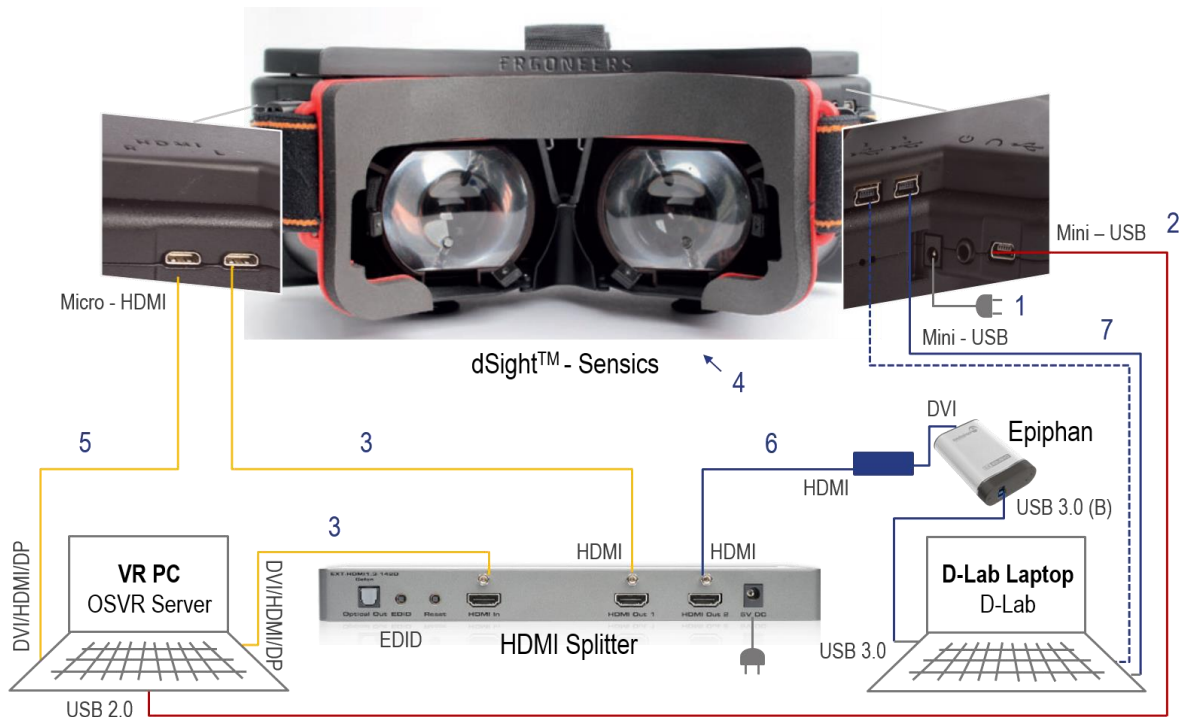
NOTE: Display settings in Windows might have to be changed. Extend Desktop to Displays 2 and 3 and choose the landscape mode with 1920x1080 resolution.

#Step 6: Connect the **Epiphan DVI2USB Grabber** with the **D-Lab PC** (USB 3.0) and the **VR PC** (HDMI/DP/DVI). Then duplicate display 2 on display 4. This will allow the Eye Tracking Software D-Lab to use the VR Video signal of the left Display as visual scene.



#Step 7: Connect the **Eye Cameras** to the **D-Lab PC** (Mini USB to USB).

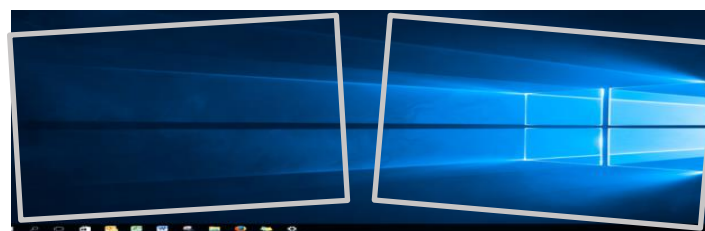
Option with HDMI Splitter



Legend: **Video Data for Displays**, **Mocular Eye Tracking**, --- **Binocular Eye Tracking**, **Gyroscope**

#Step 3: Connect the **Left display** (HDMI to Micro HDMI) via the **HDMI Splitter** to the **VR PC** (see in Setup Structure below)

#Step 4: Check Display in HMD → Desktop should be visible spread over both displays.



NOTE: Displays settings in Windows might have to be changed to Extend to Display 1, Landscape and 1920x1080 resolution or go to Trouble Shooting.

NOTE: The 2 blue LED for Ext and Link should be visible on the back of the HDMI Splitter. In case the green LED for Int is on, switch to Ext with the EDID Button on the front. This ensures the communication between the HMD, HDMI Splitter, and the VR PC.

#Step 5: Connect the **Right Display** (HDMI to Micro HDMI) directly to the VR PC → Desktop should be visible on left end right display separately.



NOTE: Display settings in Windows might have to be changed. Extend Desktop to both Displays and choose the landscape mode with 1920x1080 resolution.



#Step 6: Connect the **Epiphan DVI2USB Grabber** to the **HDMI Splitter** (HDMI to HDMI) and to the **D-Lab PC** (USB 3.0). This will allow the Eye Tracking Software D-Lab to use the VR Video signal as visual scene.

#Step 7: Connect the **Eye Cameras** to the **D-Lab PC** (Mini USB to USB).

3. OPERATION

3.1. Testing VR Environment

VR Environments for Sensics HMDs can be created with a modelling Software like Unity or Vizard and the OSVR SDK. You will find more information about the OSVR [here](#).

To enable the communication between the modelling Software and the dSight device you will have to start the OSVR Server with the appropriate configuration file depending on your use case (1 video input/2 video inputs). You will also need a different configuration file for dSights that have been produced before October 2016.

For more information please contact Sensics support and mention the serial number of HMD (<http://sensics.com/contact-us/>.)



3.2. Configuring the VR Eye Tracker in D-Lab

1. **Start D-Lab.** Make sure a licence Dongle is connected to the D-Lab PC.
2. **Create** or open a Study.
3. **Check DVI Video.** Before configuring the VR Eye Tracker please check in the Recording Device window if the video Input of the DVI grabber is available in D-Lab. You might visualise it by using the predefined visualisation in the last row of the same window.
4. **Click on the + next to Eye Tracker.** Within the Recording Devices window in Plan mode you can add a new eye tracker configuration.
5. **Switch to the Virtual Reality Tab.** Nam the Eye Tracker e.g. dSight HMD.
6. **Choose “none” for Calibration Settings.**
7. **Select the Epiphan DVI2USB as the scene camera.**
8. **Select eye camera.** Specify whether it is on the left or right eye.

You will now be able to see the device under Eye Tracker with the status Connected. To configure a binocular system, please repeat the last step for the other eye cam.

This **video tutorial** shows the setup of a monocular system: <https://goo.gl/PoNTLq>

3.3. Eye Tracking Calibration

In case you are experienced with Dikablis use the Eye Tracker like you normally use Dikablis. Otherwise follow the following steps:

Open an Eye Tracker visualization. Screen Layout → Eye Tracker visualization.

Drag and drop configured Eye Tracker in visualisation.

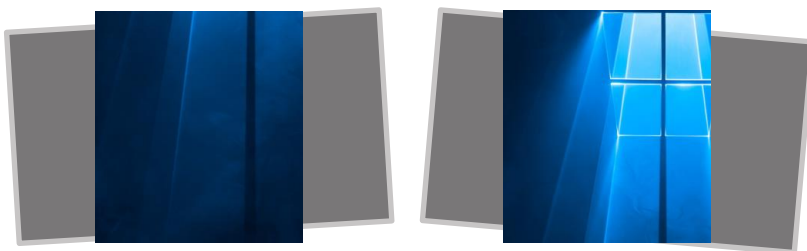
Open the calibration wizard. The calibration button is located at the top right of the eye tracker visualization. The calibration wizard will open and guide you through the steps.

You can also watch a video tutorial showing how this is done. <https://goo.gl/YMIRP7>

4. TROUBLE SHOOTING

1 Video Input (1HDMI cable in HMD)

Desktop is not expanded over both HMD displays...



1. Go to Windows Display Settings → Change the Orientation to Portrait
2. Go to Advanced Display Settings → Change Resolution to 1920 x 1080
3. Go to Windows Display Settings → Change Orientation back to Landscape

2 Video Inputs (2HDMI cable in HMD)

Left and right picture in HMD are reversed during VR Testing with two video Inputs



Go to Windows Display Settings → Switch the position of the dSight Displays by grabbing one and place it on the other side.

One of the displays is upside down...



1. Go to Windows Display Settings → Change the Orientation to Portrait
2. Go to Advanced Display Settings → Change Resolution to 1920 x 1080
3. Go to Windows Display Settings → Change Orientation back to Landscape

Don't get any picture displayed in D-Lab.

1. Check if both blue LEDs on the back of the HDMI Splitter are on
 - a. Yes: Move on to 2
 - b. No: Press the EDID Button until the green light → Press the Restart Button until one the green and the blue LED for Link are on → press the EDID Button again
2. Check if Epiphan Drivers have been installed
3. Restart D-Lab
4. Check cabling

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