

HORUS VIEW & EXPLORE

TECHNICAL DOCUMENTATION

Applied Streetview Integration

With High Resolution Cameras in the Horus environment

Horus View & Explore
info@horus.nu



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1 Introduction

This document is here to get you started with the Horus kit for integrating high resolution cameras with the Applied Streetview camera.

The document will describe the following:

- The contents of the kit.
- How to connect the hardware.
- the configuration process for the software.
- How to work with the system.

After going through this document, you should be able to start recording with this system. For more information on the Horus software, see their specific manuals.

2 Contents of the Horus Kit

2.1 What is Included

Check that all the hardware components are included in the kit. The kit should include the following items:

- 1x OBD Scanner
- 1x NMEA Antenna
- 1x OBD Reader Box
- 1x Triggerbox (TRG)
- 1x Timerbox (TMR)
- 2x FLIR Grashopper HR Cameras
- 2x XLR to XLR cables
- 1x XLR cable that terminates into 2 IO connectors
- 1x XLR to single IO connector (for the Applied Streetview camera)
- 2x USB Type A to Type B cables
- 2x USB Type A to Micro USB 3.0 cables

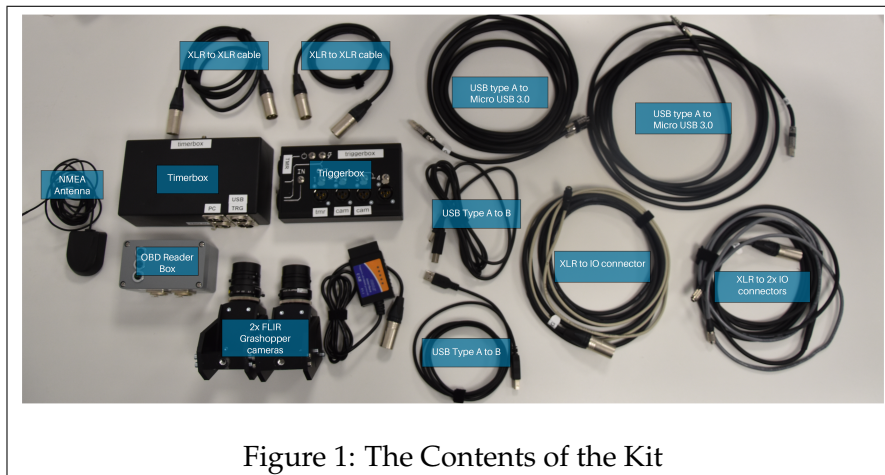


Figure 1: The Contents of the Kit

3 Hardware

3.1 Setting up the Hardware

The following chapter will describe how to plug in the hardware components.

See Appendix 6.1 for a diagram of how the system is connected.

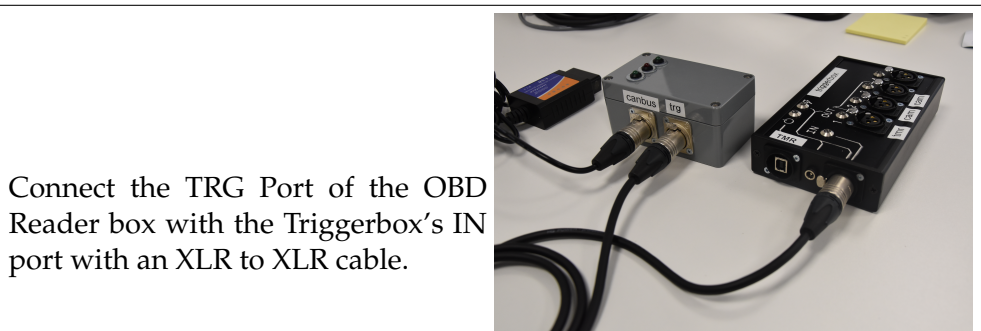
Step 1



Connect the XLR connector of the OBD Scanner to the CANBUS port of the OBD Reader box.
Connect the OBD Scanner to the OBD port of your car.

Figure 2: Connect OBD Scanner

Step 2



Connect the TRG Port of the OBD Reader box with the Triggerbox's IN port with an XLR to XLR cable.

Figure 3: Connect OBD Reader box with Triggerbox

Step 3



Use a USB Type A to B cable to connect the TMR port of the Triggerbox with the USB TRG port of the Timerbox.

Figure 4: USB Connection between Trigger and Timerbox

Step 4

Connect the TMR OUT port of the Triggerbox to the TRG IN port of the Timerbox with an XLR to XLR cable.



Figure 5: Analog Connection between Trigger and Timerbox

Step 5



Connect the NMEA antenna to the back of the Timerbox

Figure 6: Connect antenna to Timerbox

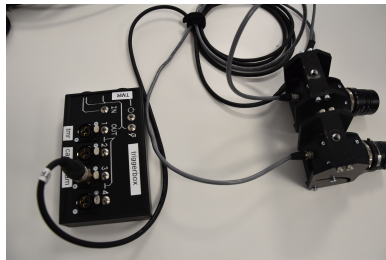
Step 6

Connect one of the CAM OUT ports with the 'RELEASE' port of the Applied Streetview, with the XLR to single IO connector cable.



Figure 7: Connect the Triggerbox to the Applied Streetview

Step 7



Plug the remaining CAM OUT port of the Triggerbox with the XLR to 2 IO connectors cable. Then plug one of the two IO connectors into one of the HR cameras each

Figure 8: Connect Triggerbox to HR Cameras

Step 8

With the USB Type A to Micro USB 3.0 cable, connect the HR Camera to a computer (This connection must be **USB 3.0**)
Do this for both HR cameras

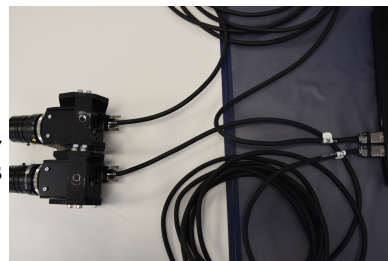


Figure 9: Connect the HR Cameras to a computer

Step 9



Finally, use the USB Type A to B cable to connect the Timerbox to a computer via the PC port.

Figure 10: Connect the Timerbox to a Computer

Step 10

Set up the Applied Streetview camera as per usual, and mount the two HR cameras.

Ready to go!

Your hardware should now be ready to go, in the next chapter we'll continue by going through the process of configuring the software.

In Figure 11, you can see how the complete system would be set up.

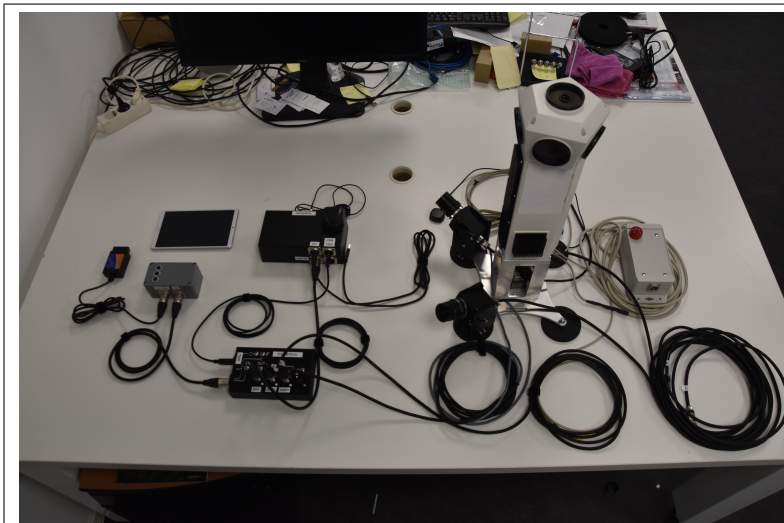


Figure 11: The Complete System

4 Software

4.1 Introduction: Software

Prior to being able to start recording with the system, there are a few steps that need to be taken to ensure that the system is working properly.

This chapter will cover the installation of the required software, and any configuration steps that need to be made.

4.2 Installing the Software

To record, process, and view & explore your data in the Horus environment there are a number of software applications that have to be installed.

These programs are the following:

- Horus MovieMaker
- Horus MovieMaker: Applied Streetview plugin
- Horus MovieRecorder
- Horus MoviePlayer

The installers for these applications are available through the enclosed USB stick.

Install the software on the system to which the hardware is connected to, by following the instructions of the installer. Ensure that the Applied Streetview plugin is installed after the Horus MovieMaker.

Our software requires a license key to function properly, if you do not have a valid license, contact Horus.

4.3 Getting the Software configured

The system requires a few things to be configured in the software, before you can start recording data.

These steps are only required for the first time, or when changes are made to the hardware.

Step 1

Start the Data Grabber and then the Recorder Builder.

Step 2

Click on 'Connect' at the top left, and load the pipeline from the enclosed USB stick.

The pipeline as seen in figure 12 should open.

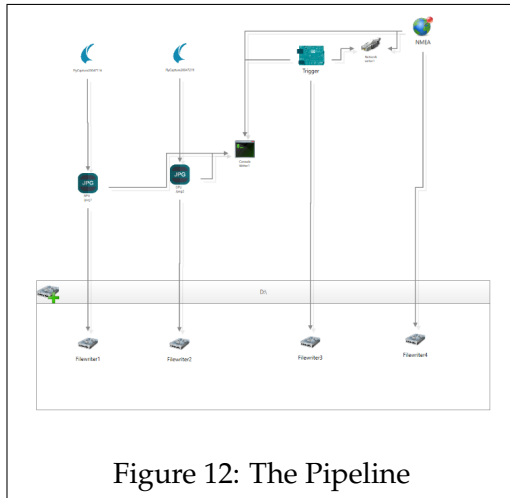
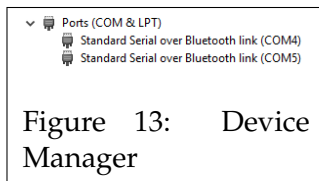


Figure 12: The Pipeline

Step 3

The first step is to tell the system from which Comports it can grab the data for the 'Trigger' and 'NMEA' components.

Open Device Manager and expand the 'Ports' section. Find the entry for the Triggerbox and the Timerbox/NMEA and note down the Comport numbers.



Go back to the Recorder Builder, click on either the 'Trigger' or 'NMEA' component and on the left, scroll all the way down till you find the property window, then set the correct Comport number. Do this for both components.

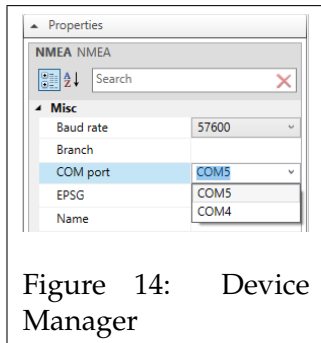


Figure 14: Device Manager

Step 4

Once the Comports are set, save the pipeline.

Step 5

Initialize the pipeline and then start running the pipeline.

In the Data Grabber window, check that the system is running correctly.

Step 6

Start the Movie Recorder.

We want to add the 'Arduino' tab to the UI, as that will allow us to control the system.

you can add the tab by going to: *Tools -> Options -> Plugins*, and then check the box of the Arduino option. Check in the 'Arduino' tab that 'Free' is set instead of 'External', and set the frequency to 4 for example.

When 'free' is selected the Triggerbox is overridden and frames will be sent at the set frequency. When Set to External the system will take images based on the interval of pulses sent by the Triggerbox

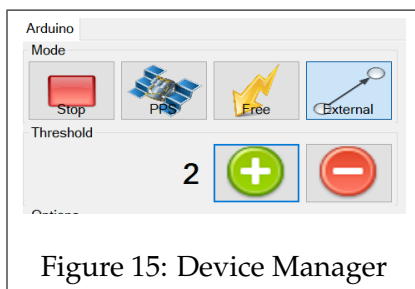


Figure 15: Device Manager

Step 7

In the Movie Recorder, view the 'Pipeline' tab and check that the amount of frames sent from the Flycapture cameras correspond to the set frequency from step 6.

If you are getting frames from both cameras, then you know that the system is getting data from the cameras.

If the camera is not sending any data or at a lower rate, check if it is running in USB 3.0.

Step 8

The final step is to create the 'setup.hsf' file.

This file tells the Movie Player the amount of streams it can show, and where the different streams are projected in the viewport. For this step, please **contact Horus** for support in creating the 'setup.hsf'.

System Ready to Start Recording

After following these steps, your system should be ready to use.

If you plug the USB cable from the Timerbox into another USB port, you may need to recheck the set Comports.

If you change the position of the HR cameras, the position of the camera in the 'setup.hsf' will require adjustment (This can be done through the Movie Player).

5 Working with the System

5.1 Introduction: Using the System

Now that the system is ready to go, you can start recording data. The following chapter will describe the process of recording, processing, and viewing the data.

5.2 Recording Data

The following section will describe the steps for recording images.

Step 1

Start the Data grabber, Recorder Builder, and Movie Recorder. Initialize and start running the pipeline.

Step 2

Check if the system is running properly by checking the incoming frames from both of the cameras.

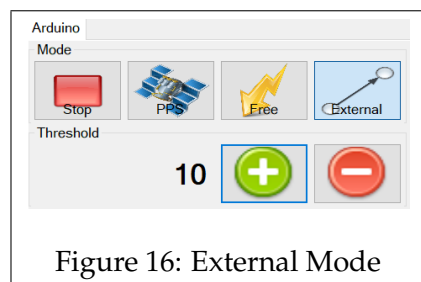
Step 3

In the Arduino tab, set the 'External' mode as active, and specify the 'Threshold' value.

When the system is set to 'External' mode, an image will be taken when the Triggerbox sends a pulse.

The 'Threshold' value determines the interval between each pulse. A Threshold value of 1 will create a pulse every 0.5 meters, so if you want to take an image every 5 meters, the threshold value should be set to 10.

1 = 0.5 meters



Step 4

Whilst standing still, start the recording for both the Applied Streetview, and Horus system.

It is important to be stationary when starting the recording.

Step 5

Do your recording.

Step 6

Once you are done with your recording, come to a standstill.

Only once you have stopped you may stop the recording of both the Applied Streetview, and the Horus System.

It is important to be stationary when stopping the recording.

5.3 Processing the Data

Before the recorded data can be viewed, it needs to be processed.

Step 1

Ensure that the computer has access to the recordings from both the Applied Streetview, and the HR cameras.

Step 2

Convert the images from the Applied Streetview system into single equirectangular images via the Applied Streetview software.

Step 3

Convert the Images from the Applied Streetview into the Horus format via the Movie Maker Applied Streetview plugin.

Start the Movie Maker software.

Click on: File -> Import Data..., and then select 'AppliedStreetview'.

A window should open with the Applied Streetview plugin as seen in figure 17.

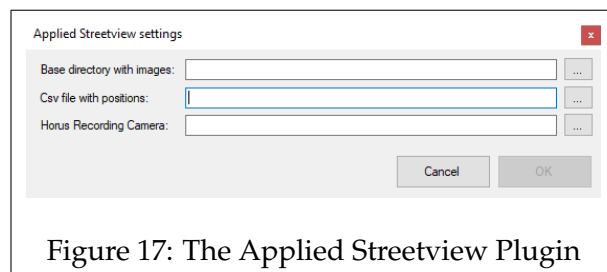


Figure 17: The Applied Streetview Plugin

- **'Base directory with images'**, the directory with the images from the Applied Streetview.
- **'Csv file with positions'**, the 'panorama.csv' file from the Applied Streetview.
- **'Horus Recording Camera'**, The .idx file from one of the HR cameras.

Enter the paths to the directory/files to the plugin, and then press 'OK'. The plugin will then start converting the images from the Applied Streetview into the Horus format for use with the Horus Movie Player. The created files will be placed in the recording directory.

Step 4

The final step is to regenerate the 'frames.xml'. Go to the recording directory, find the 'frames.xml' file, and delete it, then then next time you start the Movie Player, a new 'frames.xml' will be generated.

5.4 Viewing the Data

Now that the data has been processed, the images from both the Applied Streetview and the HR cameras can be viewed in the Horus MoviePlayer.

Importing data into the Horus Movie Player

Open the Horus Movie Player and open any of the '.idx' files in the directory.

bigbreak

The images from both the Applied Streetview and the HR cameras should be shown in the viewport.

If there is a camera stream missing, check if the 'setup.hsf' is set up correctly.

Adjusting the scene

After loading in the recording, you might want to change/finetune the position of the (HR camera) images.

This can be done through the 'Settings' menu (figure 18), or through the 'Immersive View Builder' module (figure 19).

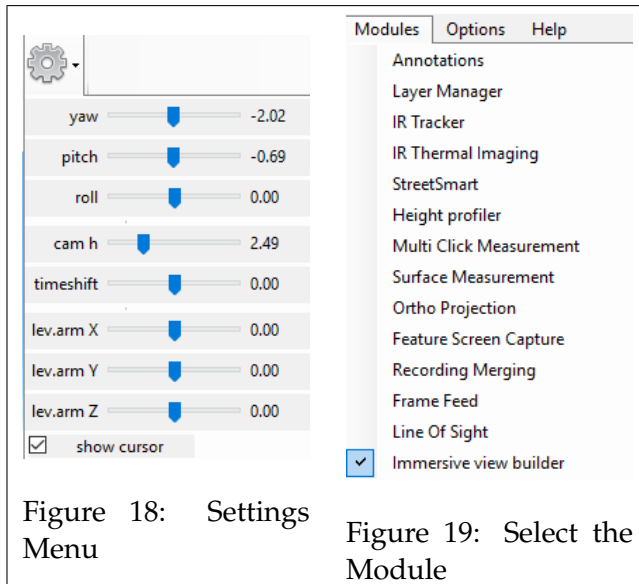


Figure 18: Settings Menu

Figure 19: Select the Module

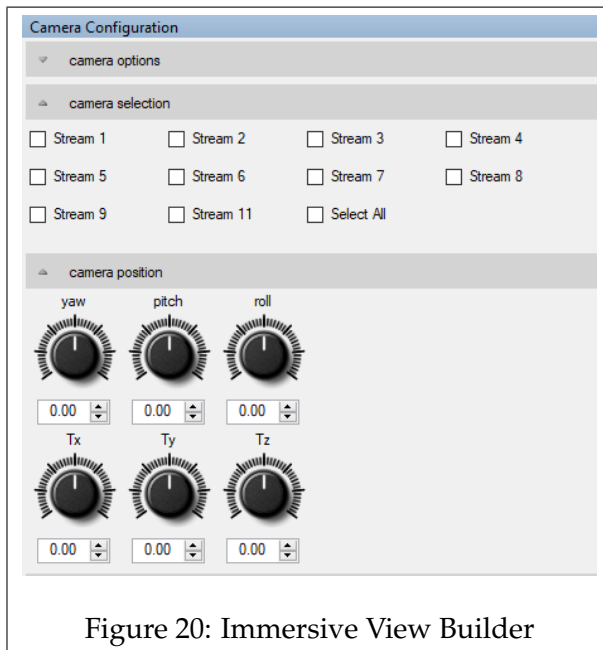


Figure 20: Immersive View Builder

6 Appendixes

6.1 Hardware Diagram

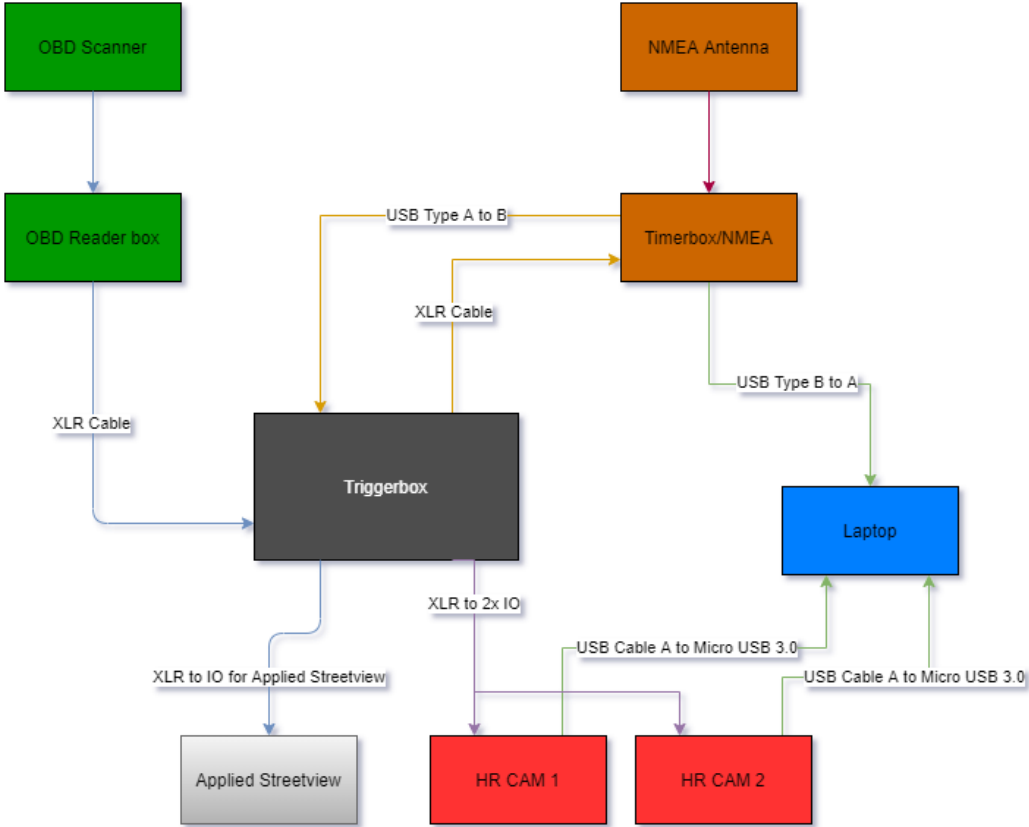


Figure 21: Applied Streetview with Horus Kit Diagram