

TechoDollyMobiCam

A LIVE Camera Plugin
for
AUTODESK MOTIONBUILDER 2011
and
TechnoDolly camera cranes

Users Guide

Provided

by



EckesVision

Lukasstrasse 16D, D-50823 Köln
Germany

Version 21.11.2010

Introduction

TechoDollyMobiCam is a camera device plugin for *AUTODESK MOTIONBUILDER*. It enables MOTIONBUILDER to receive camera tracking data provided by TechnoDolly cranes via a RS-232 (Serial Port) connection or from the local Ethernet network (either UDP or TCP).

The camera device enables MOTIONBUILDER to visualize the motion of the camera in real-time and to record it for later use. It also supports LIVE Previsualization in which MOTIONBUILDER realtime render engine renders the scene from the perspective of the virtual TechnoDolly camera in real-time. Preview scenes can be imported into MOTIONBUILDER from such generic modeling software such as AUTODESK MAYA or AUTODESK 3D STUDIO MAX by using the AUTODESK FBX format.

TechoDollyMobiCam is available for MOTIONBUILDR 2011 running under the operating system Windows XP Professional (32 Bit) and Windows 7 (32bit and 64bit).

Components

The software MobidTrack consists of the following items:

- **bin/mb2011win32/tdcam.dll**: The plugin-in DLL for MotionBuilder 2011 32-Bit
- **bin/mb2011win64/tdcam.dll**: The plugin-in DLL for MotionBuilder 2011 64-Bit
- **doc/tdcam_manual.pdf**: Documentation of the plugin.

Installation

- Locate the installation directory of your MOTIONBUILDER installation and the corresponding plugin directory. If, for instance, MOTIONBUILDER 32-Bit has been installed under “C:\Program Files\Autodesk\MotionBuilder 2011” the plug-in directory can be found under “C:\Program Files\Autodesk\MotionBuilder 2011\bin\win32\plugins”. Or, if MOTIONBUILDER 2011 64-Bit may has been installed at “C:\Program Files\Autodesk\Autodesk MotionBuilder 2011 64-bit” the plugin directory is located under “C:\Program Files\Autodesk\Autodesk MotionBuilder 2011 64-bit\bin\x64\plugins”.
- Install **TechoDollyMobiCam** by copying the “**tdcam.dll**” version matching your version of MOTIONBUILDER to the plugin directory of your MOTIONBUILDER installation. Note, that you may need Administrator Privileges under Windows 7/Vista to copy the DLL to the plugin directory.
- Start MOTIONBUILDER. The new device **TechnoDolly Camera** appears under the DEVICES section in the ASSET BROWSER (see Figure 1).

Using TechoDollyMobiCam

1 *First set-up*

Please, start MOTIONBUILDER after installing the plugin and switch to the **Creation** layout to match your view with the illustrations used in this manual “**Menu->Layout->Creation**”. Note, that MOTIONBUILDER may use a different layouts depending on the size of your visual screen.

Navigate to the new device 'TechnoDolly Camera' depicted with an I/O icon, visible under the **Devices** section in the **Asset Browser**. Select it and drag it into the **Viewer** window to activate it.

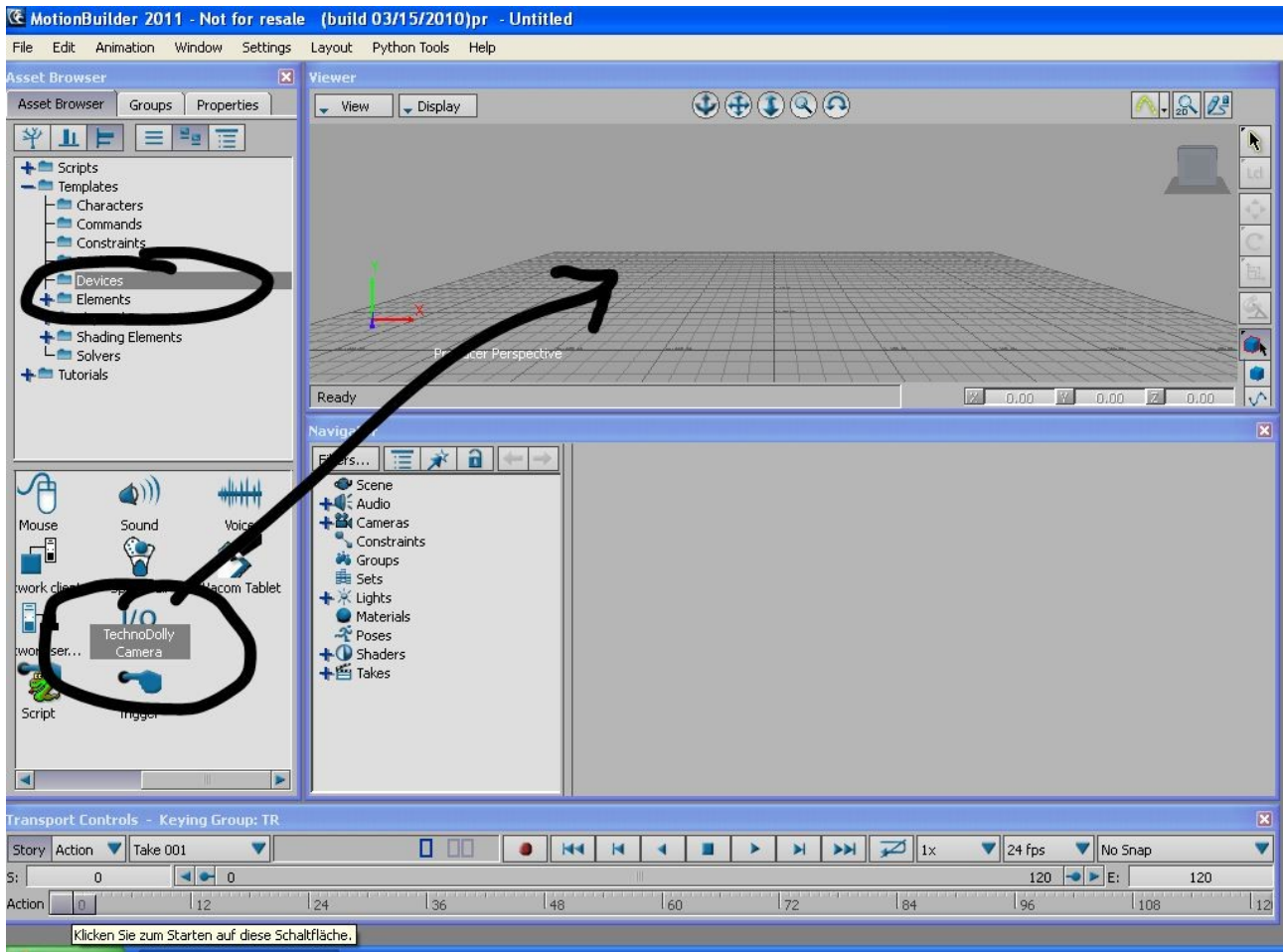


Figure 1: Activation of the TechnoDolly Camera plugin

A new window appears below the **Devices** entry in the **Navigator** window: Three master control switches (**Online, Live, Recording**), set-up for the current model binding and some space for status information (sample rate and device info) are visible on the left side. The right hand-side of the TechnoDolly Camera window contains 4 tabs:

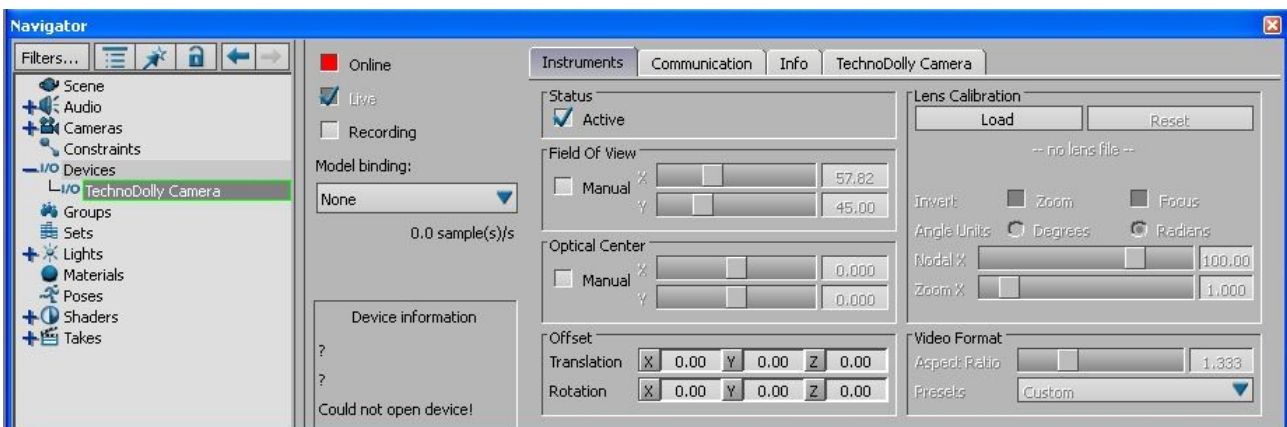


Figure 2: TechnoDolly Camera device with 1st tab showing basic parameters

The first tab contains all parameters of the virtual camera: A switch to activate or deactivate the camera, manual overrides for field of view and optical center settings and translation and rotation offset to align the coordinate system of the TECHNODOLLY crane with the virtual scene in MOTIONBUILDER. Moreover, a data file defining the lens calibration can be set as well as the video format.

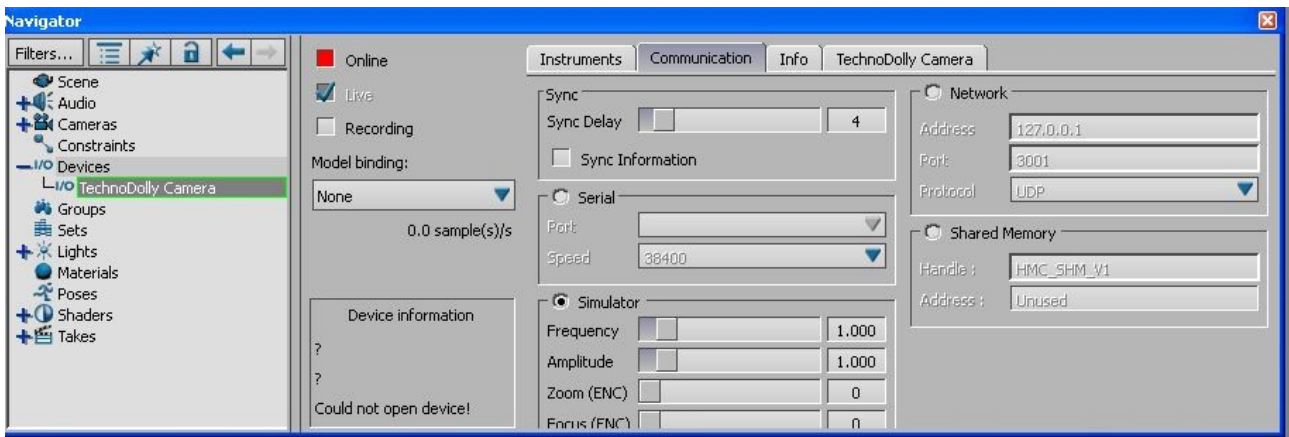


Figure 3: TechnoDolly Camera device with 2nd tab defining the data source

The second tab defines the data source and synchronization of the data. You can select either **Serial**, **Simulator** or **Network**. Shared memory is not yet supported by the plugin.

- **Serial:** For TechnoCranes, you receive the data from a RS-232 interface (Serial port) – please select the proper port (e.g. COM1) and the correct speed of the connection. Check also under the 4th tab labeled *Technodolly Camera* that the correct protocol is set. The default setting in MotionBuilder is the ASCII format but TechnoDolly may send the data in the binary format! Check if the settings match with the settings defined in the TechnoDolly control. Check also the speed: TechnoDolly use often 115200 baud but better check with your setting in the TechnoDolly controls.
- **Network:** You may receive the camera data also via Ethernet network: Select the proper port to which the data is send to the local machine MOTIOBUILDER runs on (e.g. port 3001) and the IP-adress of the sender, in case TCP is used. For UDP you may use localhost (127.0.0.1) since UDP does not use a return channel to the machine sending the data to handle package loss. For low latency, UDP use is recommended. Make also sure, that a network firewall is not blocking the port. Note, that sending the camera data in binary protocol via network is considered experimental and has not yet been tested carefully.
- **Simulator:** For test purposes, a simulator can be used to generate synthetic periodic motion of the camera which can be controlled by the settings in *Frequency*, *Amplitude*, *Zoom* and *Focus*.

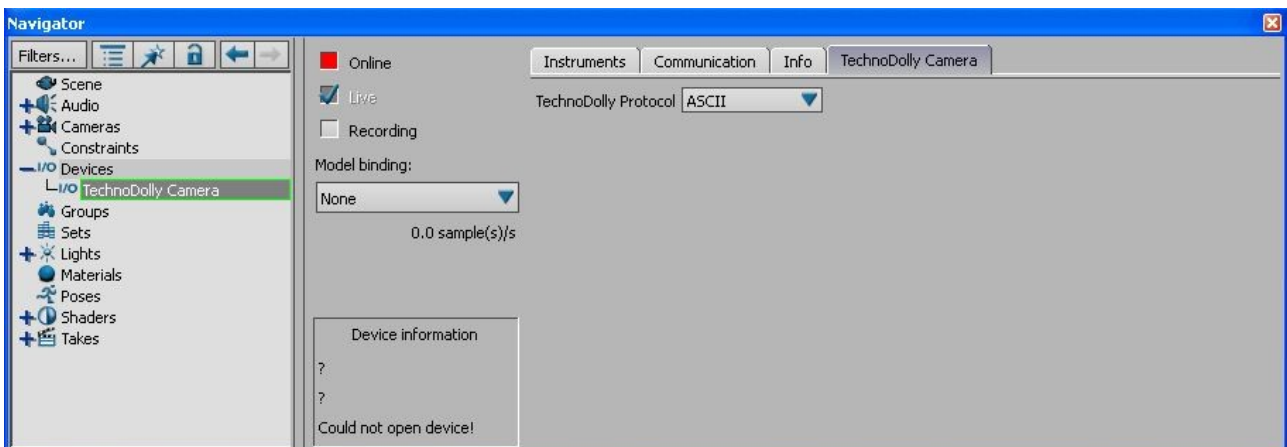


Figure 4: TechnoDolly Camera device with 4th tab defining the communication protocol

The last tab controls the kind of protocol the data is received by this camera device. This must match with the settings in the TechnoDolly controls. The 3rd tab **Info** contains rather general information about the meaning of the camera parameters.

2 Active the camera

After selecting the proper input devices (either Simulator, Serial or Network), the camera can be activated by the following steps (see figure 6 for a screen shot):

- I. Create a model binding by using **CREATE ...** in **Model Binding**:. The entry *TDCam:Root* appears as a new model binding for the camera device and a camera model representing your camera appears in the **Viewer** at the origin of the scene.
- II. Switch camera to online mode by pressing the red indicator box labeled **Online**. The device is opened and data is polled by MotionBuilder from now on from the selected data source. The sample rate of the device is shown in the info box (60 samples /s for the Simulator). The indicator changes its color from red via yellow to green.
- III. Switch on **LIVE** mode by checking the **Live** switch if it is not already checked: The camera model in the **Viewer** starts to moves according to the data currently read live from the device.

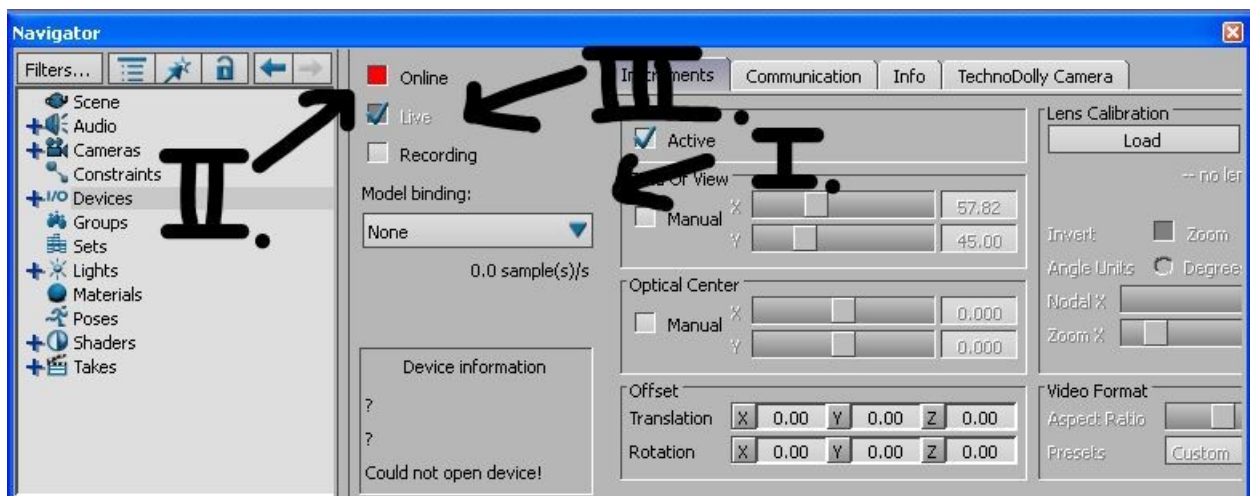


Figure 5: Activate the camera and switch on LIVE mode

The device panel as well as the Viewer should look like this now:

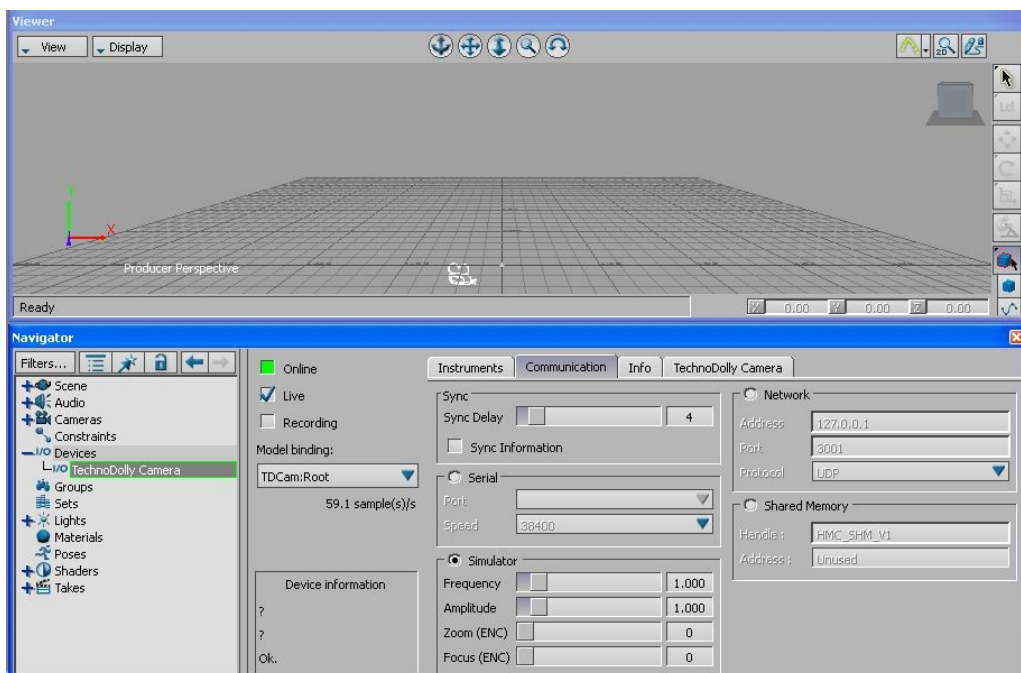


Figure 6: Camera is active and moves in LIVE mode according to the simulator setting

You may now switch the **Viewer** to the viewport of the TechnoDolly Camera by selecting in the

Viewer the View → Perspective → TDCam:Camera as input source:

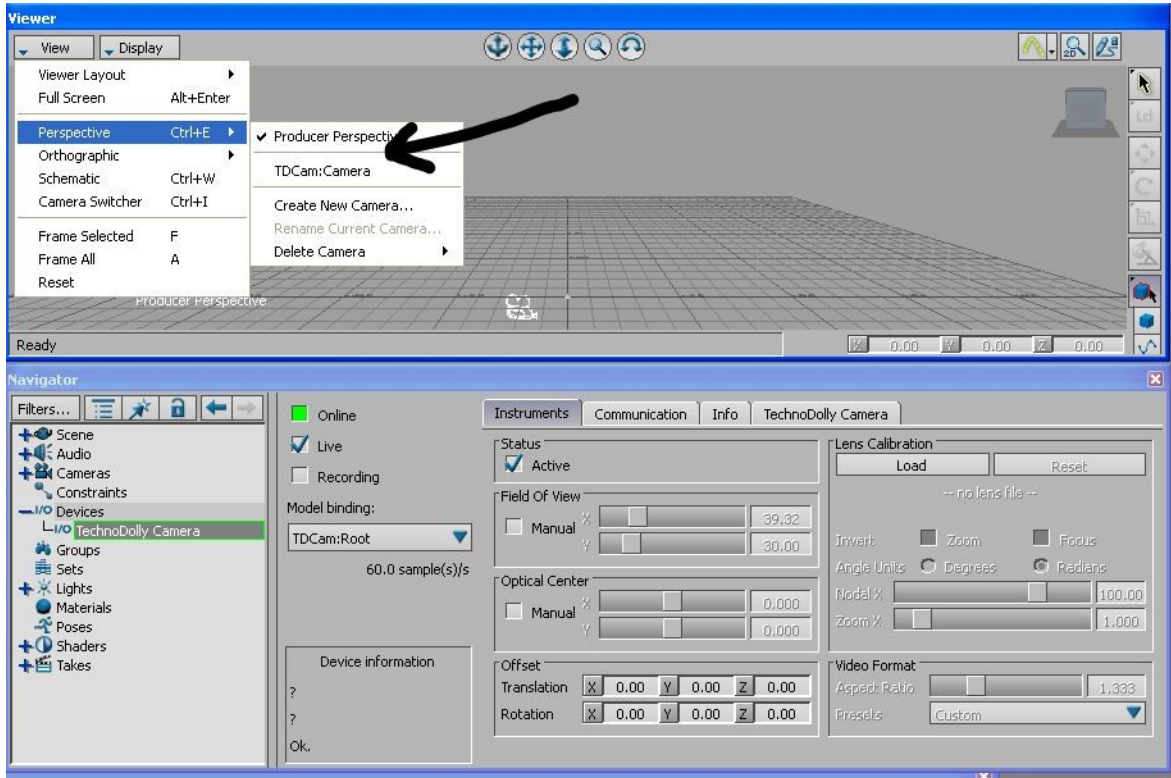


Figure 7: We now switch to the TechnoDolly Camera ...

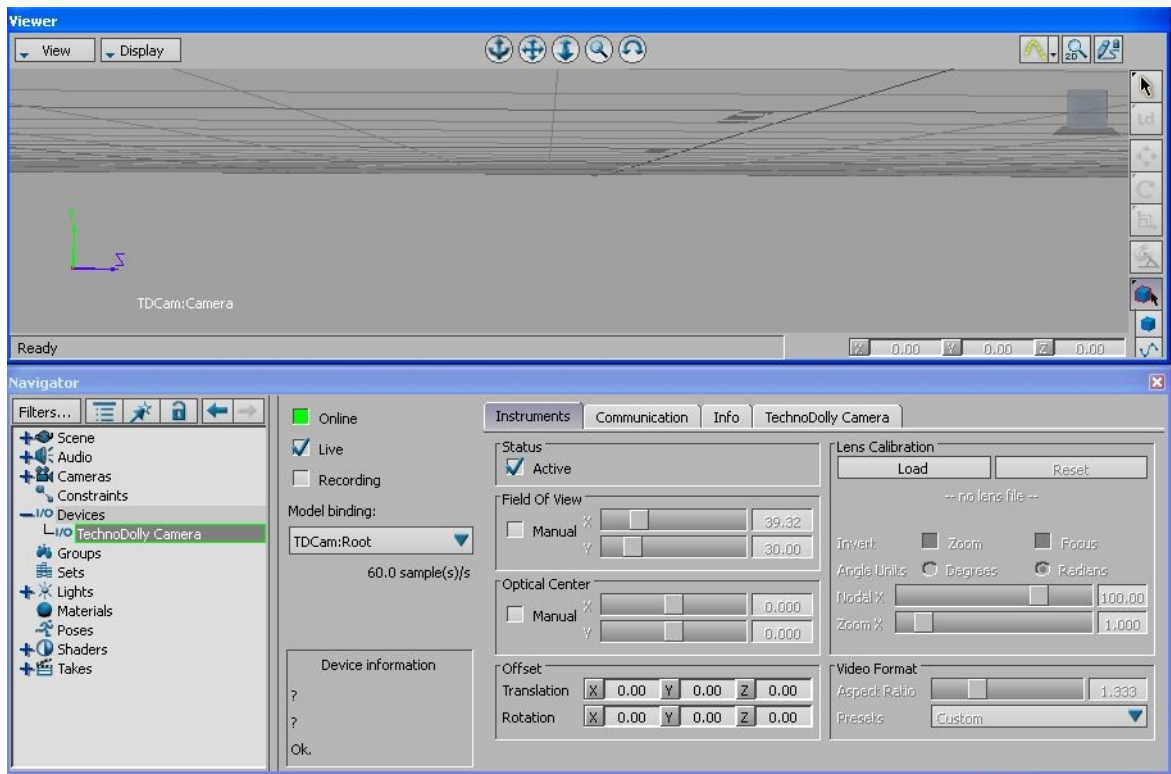


Figure 8: ... to view the scene from the TechnoDolly Camera point-of-view

You may also switch between Normal and Fullscreen mode back and forth by pressing ALT-Enter in the **Viewer** window. The scene now moves live according to the camera data send to the plugin from the TechnoDolly camera crane in real-time.

3 Live previs: How to view the camera with a scene

Activate the camera as explained in the former section. A previs scene can be added to the current scene by **Merging** the FBX-Data to the current scene (**File** → **Merge**). Press **Merge** in the FBX popup window where you can select the parts of the scene you want to import.

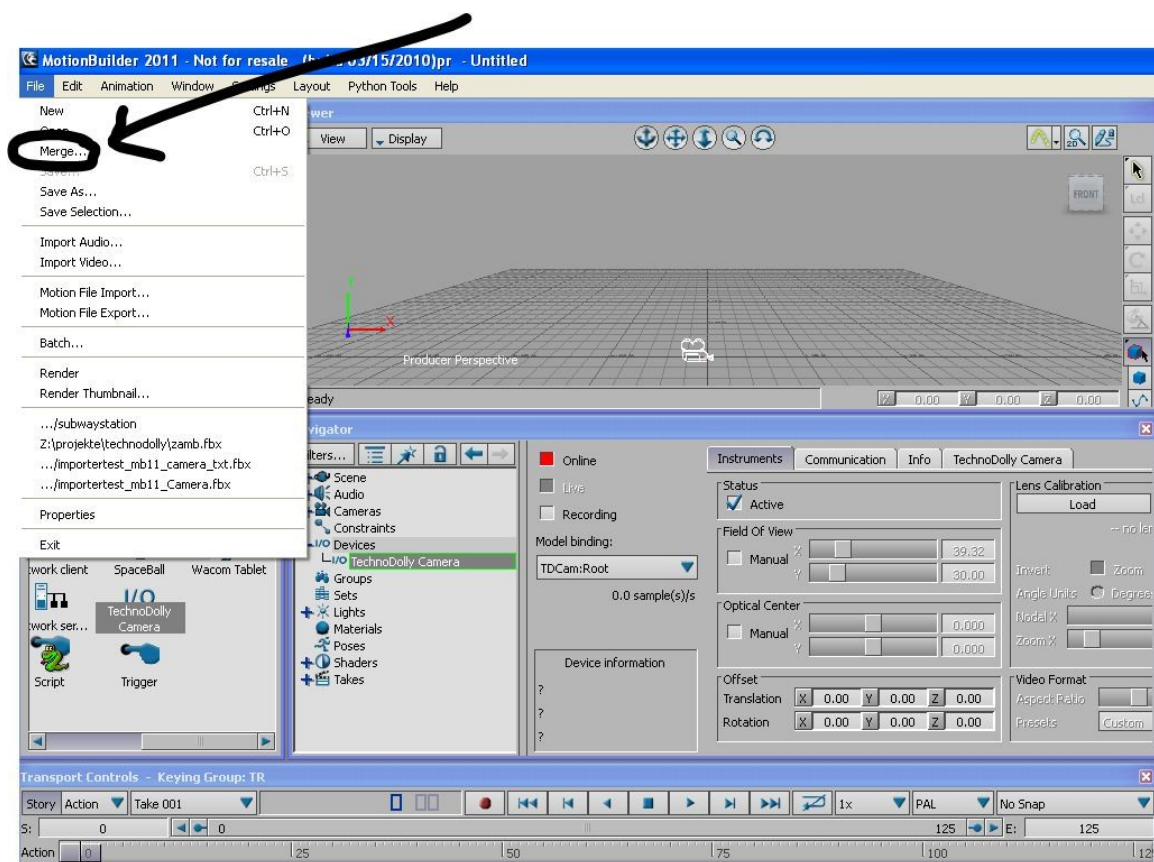


Figure 9: Merge a scene to the empty scene with a camera (not yet switched on)

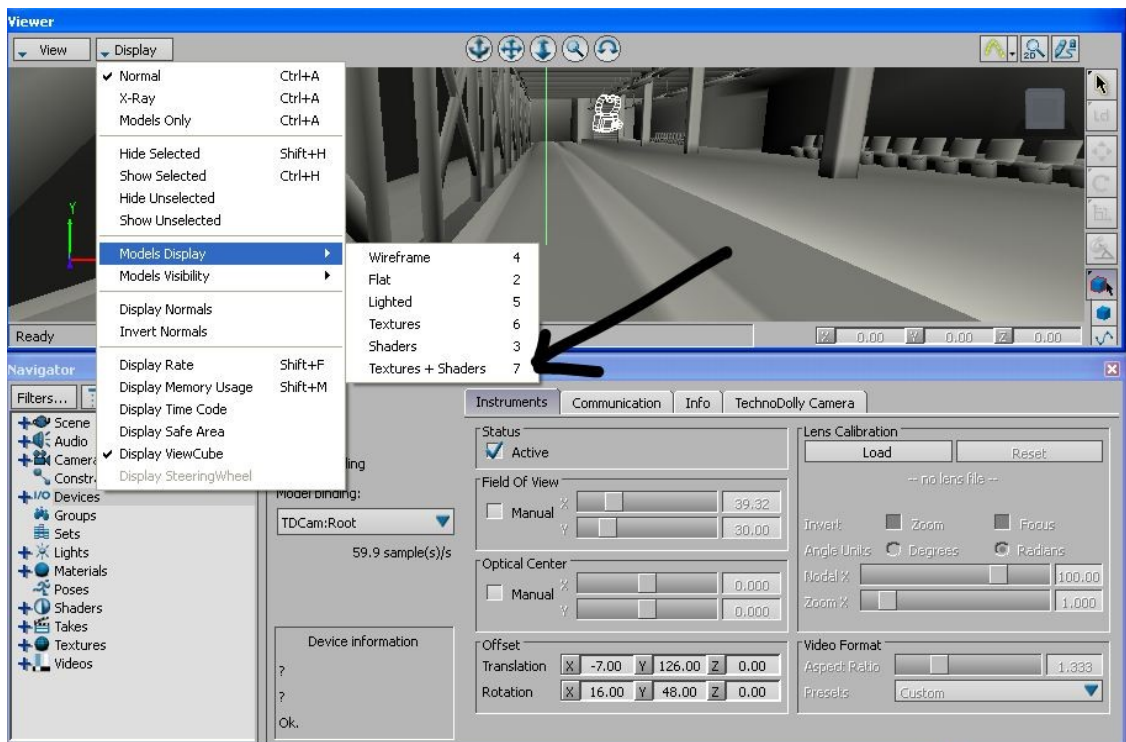


Figure 10: After merging, switch to texture rendering, (re)activate the TechnoDolly camera, switch to the TechnoDolly point-of-view (**View**→**Perspective**→**TDCam:Camera**). Adjust the offset to

position the camera properly to view the scene and use ALT-enter in the **Viewer** to switch to fullscreen mode. Have fun!

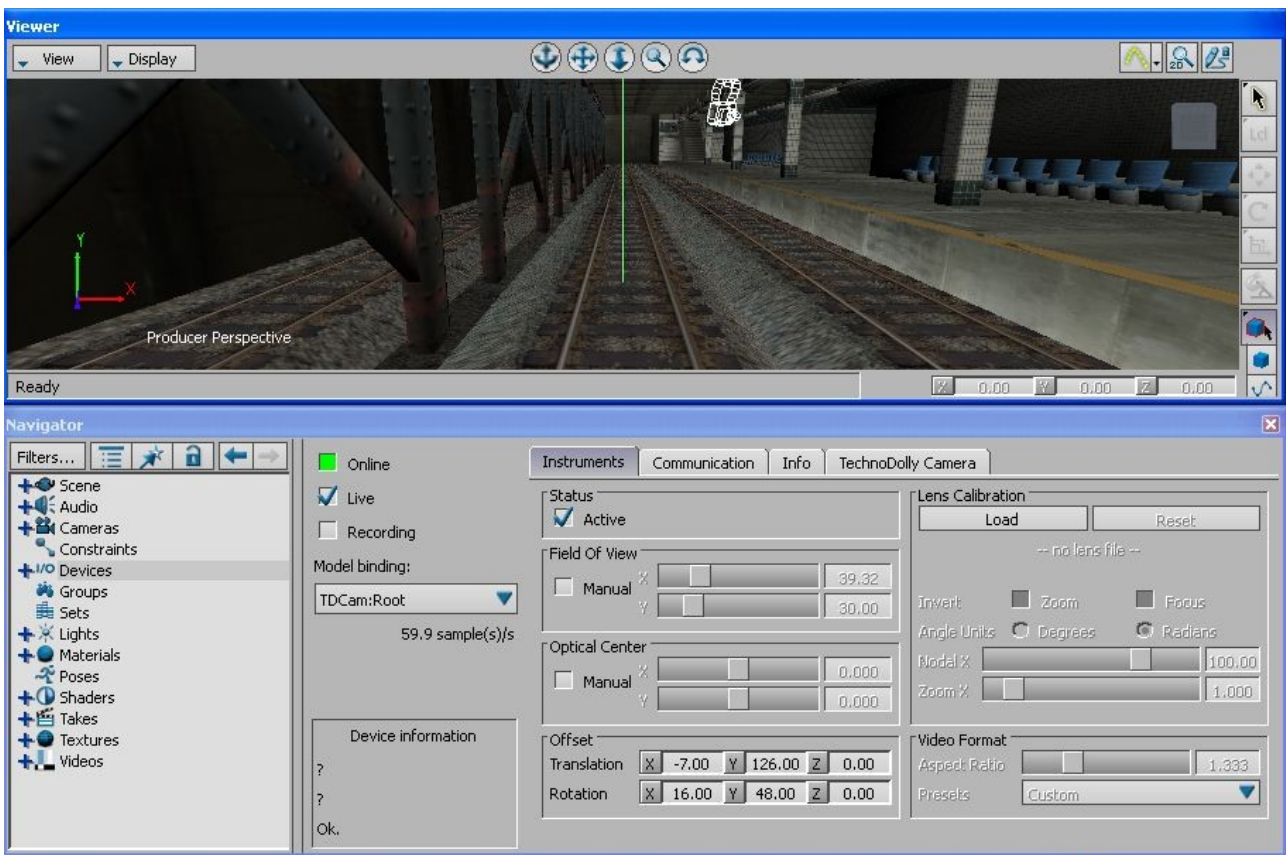


Figure 11: Test scene with TechnoDolly Camera from the **Producers Perspective**

4 Record and replay data

In order to record the camera motion, check the **Recording** checkbox in the TechnoDolly Camera window to register the camera data for recording. Use the **Transport Controls** to record the data by pressing the red **Record** Button, either by creating new track or overwrite an old one, and press the **Play** Button to start the recording. Press the **Stop** button to stop and the **Rewind** button to rewind to the beginning. Deactivate the TechnoDolly Camera device and watch the recorded camera motion. You may also save the data as FBX for later use.

Troubleshooting

Problem	Suggested Solution
Serial mode does not work.	Do you use the ASCII or Binary protocol ? Please check, if the setting in the TechnoDolly Camera 4 th Tab in MotionBuilder matches with the setting in TechnoDolly. Is the speed setting correct? TechnoDolly often uses 115200 baud.
My serial device (e.g. "COM1") does not appear under Port below Serial in the Communication device tab of the TechnoDolly Camera device.	Please take a look at the Device Manager in Windows (Systems Properties → Hardware → Device Manager). Is a Serial Device (COM1/2/3/4?) visible under Ports (COM & LPT) ? If not, you may have switched off your serial support in Windows or in the BIOS and MotionBuilder therefore cannot access it. Reconfigure until a Serial Device appears

	<p>under Ports in the Device Manager in Windows. . Or do you use a Serial-to-USB converter ? Have you installed the driver and configured it to use COM1 ? COM1 must be visible in the Hardware Manager under Ports (COM & LPT) before you can use it in MotionBuilder. Please note, MOTIONBUILDER does not support COM devices with numbers larger than 4.</p>
<p>MotionBuilder starts with an error message complaining about "... not finding an access point to ? Bind@PBTCP@ORSDK80 or @ORSDK90 in the Library FBSDK.DLL". Even worse, you cannot find any TechnoDolly Camera device in the device section of MotionBuilder later on.</p>	<p>It is most likely that the wrong version of the plugin has been installed. Please check that you have used mb2011win32/tdcam.dll for MotionBuilder 2011 32-bit or mb2011win64/tdcam.dll for MotionBuilder 2011 64-bit.</p> <p>Note, other versions of AUTODESK MotionBuilder are not yet supported by the current version.</p>