SAM BalanceLab

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2 Camera Operation Quick Start Guide

This Quick Start Guide describes the installation and operation of a camera together with the SAM BalanceLab system.
Any camera that is Windows compatible or provides a Windows driver can be operated with the system. If the camera has an external microphone or audio input channel the automatic synchronization feature "Audio-Sync" can be used.

Be sure to have the SAM BalanceLab software installed and running before starting to connect a camera to the system!

Please follow this guide step by step to get your camera connected and record your first video with the SAM BalanceLab software.

Step 1: Prepare Camera Installation

If you like to use the automatic video synchronization feature of SAM BalanceLab you will need a video camera with external audio or microphone input.
In this case be sure to have the Audio-Sync cable connected to your BalanceLab hardware (see page 1, illustration 4 of the "System Installation Quick Start Guide").
Important: If you do not use the Audio-Sync feature you should manually synchronize your camera to the force data. Otherwise there will be a time offset between the video and the force data!
In step 4 and 5 you find further instructions to check and set up the synchronization.

For the connection of your camera to the computer you will need a data link cable. Depending on your camera this can be a Firewire data link cable or a USB cable. For Mini-DV cameras this will be a Firewire cable, for most web cameras or other cameras a USB cable.
The camera and the cables are NOT included in the SAM BalanceLab package, so be sure to have the right cable available before continuing with the installation.

1 Connect your camera to the PC / Laptop

Connect your camera to the computer. There are different interfaces available depending on the camera you use. The most common are:

- Firewire (also known as IEE 1394)
- USB

Please refer to the original documentation of your camera on how to install and connect the camera to a Windows computer. The camera has to be completely installed before you can continue with the next steps!

2 Connect Audio-Sync cable for automatic video synchronisation

This feature can only be used if your camera has a microphone or audio input connector!

To connect the metal plug of the Audio-Sync cable to the cameras' microphone input. The other plug of the cable (black plastic) has to be connected to the BalanceLab hardware connection port.

See the "System Installation Quick Start Guide" for details on how to connect the "Audio-Sync" cable to the BalanceLab hardware.

Step 2: Software settings

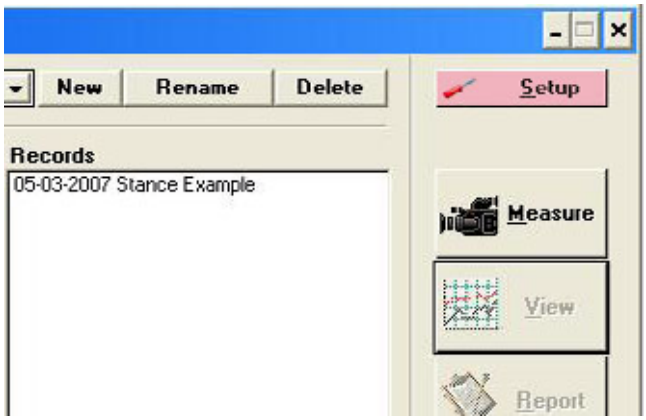
1 Start the SAM BalanceLab software

Start "SAM BalanceLab 1.0" via the desktop icon which was created during the software installation. You can also start the software through the Windows start menu under "Programs" and "SAM BalanceLab 1.0."

2 Video Setup

a) Start hardware Setup
At the main program screen choose "Setup" to enter the "Hardware Setup".

Be sure that you have installed your camera software and that the camera is connected to your computer.



b) Open Video Settings
The "Hardware Setup" window will show up. Choose "Settings" now in the "Video Capture Device" section.

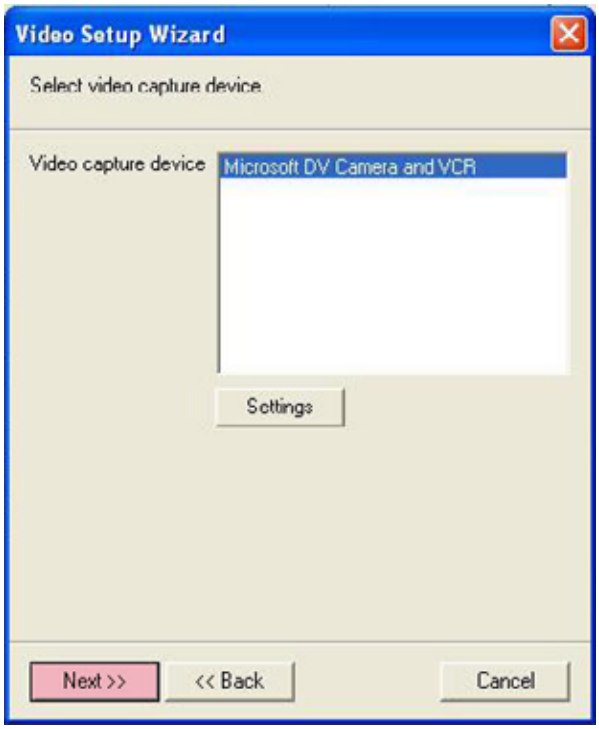
c) Video Setup Wizard – page 1

The "Video Setup Wizard" window will open.

You will see a list of all available cameras. If your camera is not listed it is either not connected or not installed successfully in the windows system. In this case please refer to the operation manual of your camera.

Choose your camera from the "Video capture Device" list and press "Next".

This screen can look different depending on the camera used.



d) Video Setup Wizard – page 2

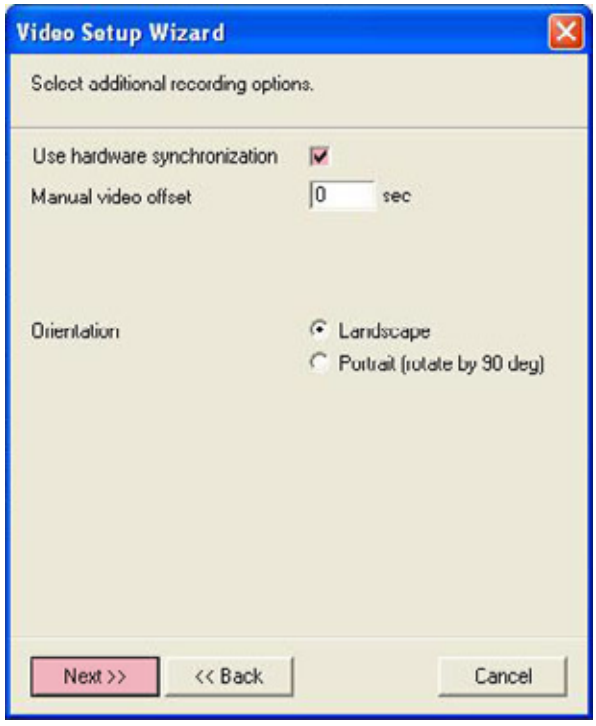
This page offers some special settings:

If you want to use the automatic video synchronization feature, then check the box "Use hardware synchronization", otherwise uncheck this box.

Please note that you need the Audio-Sync cable connected to your camera to use this feature.

You can also switch the orientation of the recorded video in the section "Orientation". So if you like to have a video in portrait format this can be set here.

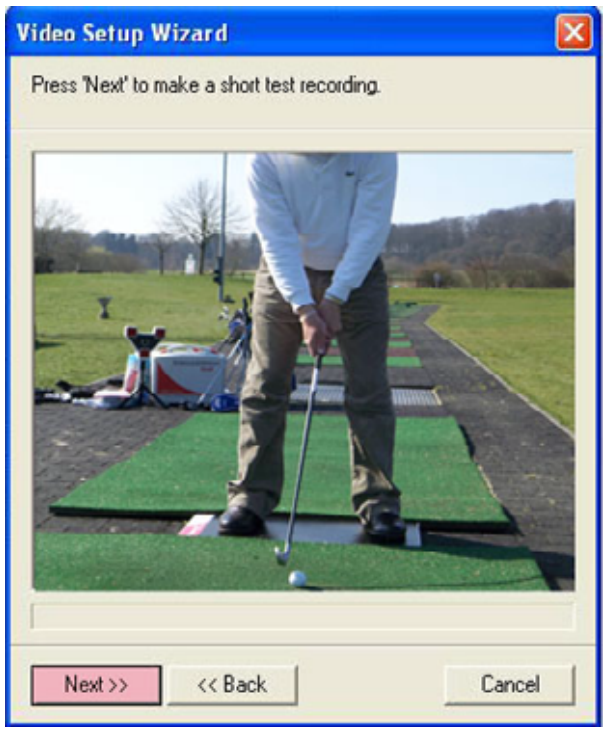
If you are finished with the settings click "Next".



e) Video Setup Wizard – page 3

This window should already show you a live video of your camera. If you don't see the live images please check if your camera is online and check the camera settings.

If you see the live video click "Next" to start a test recording now.

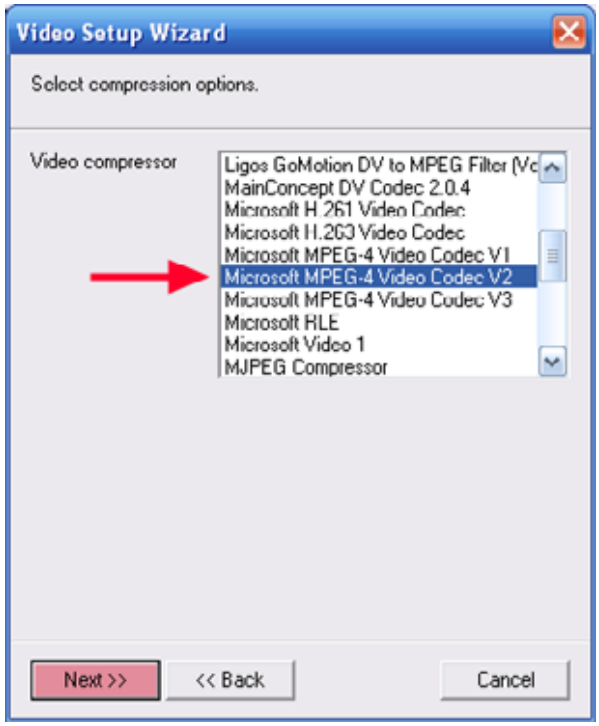


f) Video Setup Wizard – page 4

In the "Video compressor" list you will see all installed video compressors (codecs) of your system.
The video compressors are needed to reduce the file size of the recorded videos.

This dialog allows you to test different compressors to find the best.

By choosing a compressor and click "Next" the video will be compressed and replayed in the next screen. You can decide to keep this compressor or to try a different one.



In our tests the "Microsoft MPEG-4 Video Codec V2" Compressor offered a good ratio between compression and quality. If this compressor is not available on your system you can install it from the BalabceLab installation CD. See the "Appendix 1 – installing video compressors" at the end of this document to find out how to install the MPEG-4 codec.

After installing a new compressor you have to repeat the "Step 2" of this Quick Start Guide.

As alternate solution you can also try the "Indeo video 5.10" or any other compressor installed on your system.

g) Video Setup Wizard – page 5

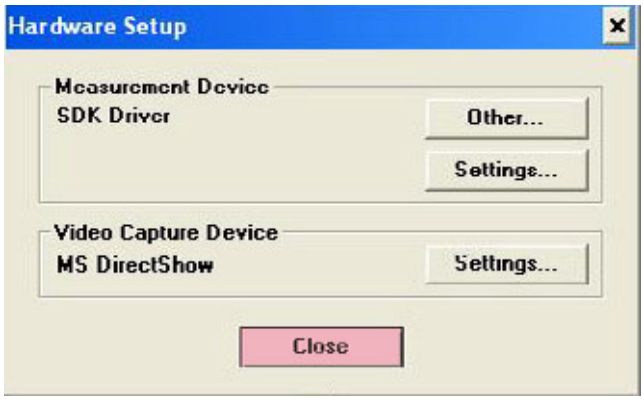
This page of the "Video Setup Wizard" allows to check the quality of the video compression settings.

You will see the compression size on the right below the video. The number should be below 20%, otherwise the compression performance is not good enough. If the value is higher than 100% the selected compressor failed. Please press "Back" in this case, select a different compressor and repeat the test.

To see the compressed video press the ▶ Button.

If you are comfortable with the quality and compression rate click "Next" to finish the "Video Setup Wizard"

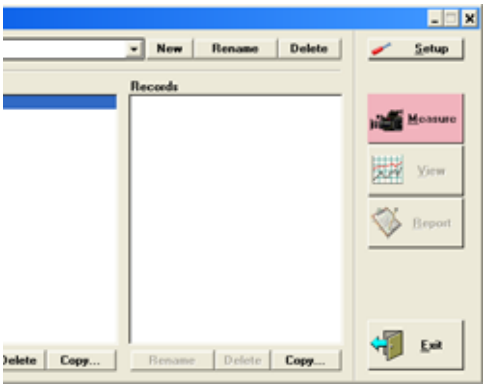
g) Finish Video Setup



To finish the setup and go back to the main program press "Close" on the "Hardware Setup" window.

Step 3: Do a measurement with video

1. Click the "Measure" button at the right part of the "Database" window.



2. In the opening "New Record" window choose "Stance Analysis" in the "Type" section on the left.

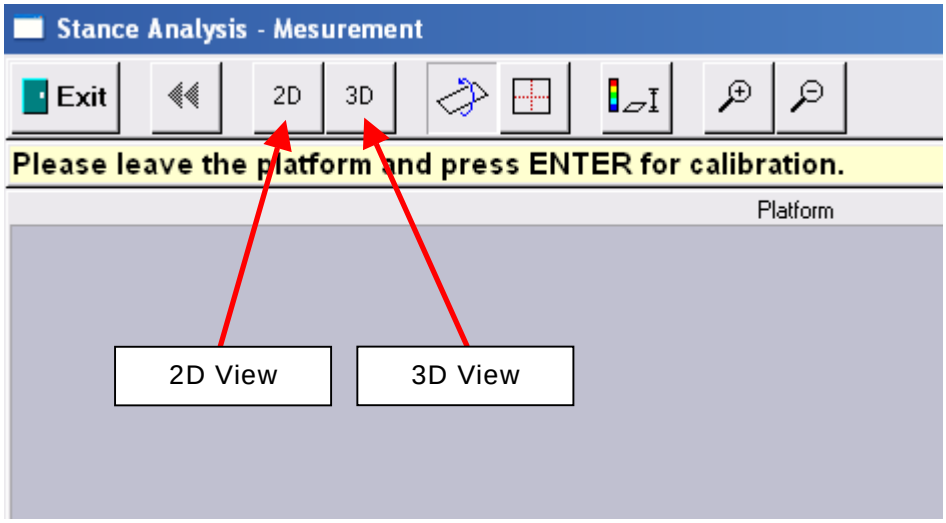
   At the "Configurations" section on the lower right choose: "Stance + Video".

   Be sure that the SAM BalanceLab and the camera are connected to your computer via DV / Firewire or USB cable .

   Now click the "Start" button.

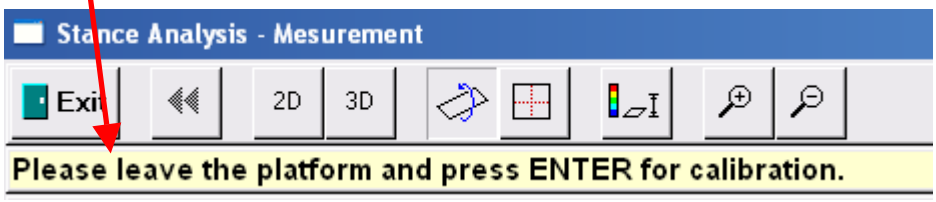
3. Wait until the software has initialized the hardware.

4. When the software enters the "Measurement" window you can choose between a 2D or 3D graphical view of the force distribution. Use the "Top view" or "3D view" button at the upper left .



5. Follow the instructions of the yellow box at the upper left:

- Leave the SAM BalanceLab
- Press the "ENTER" key at your computer for calibration



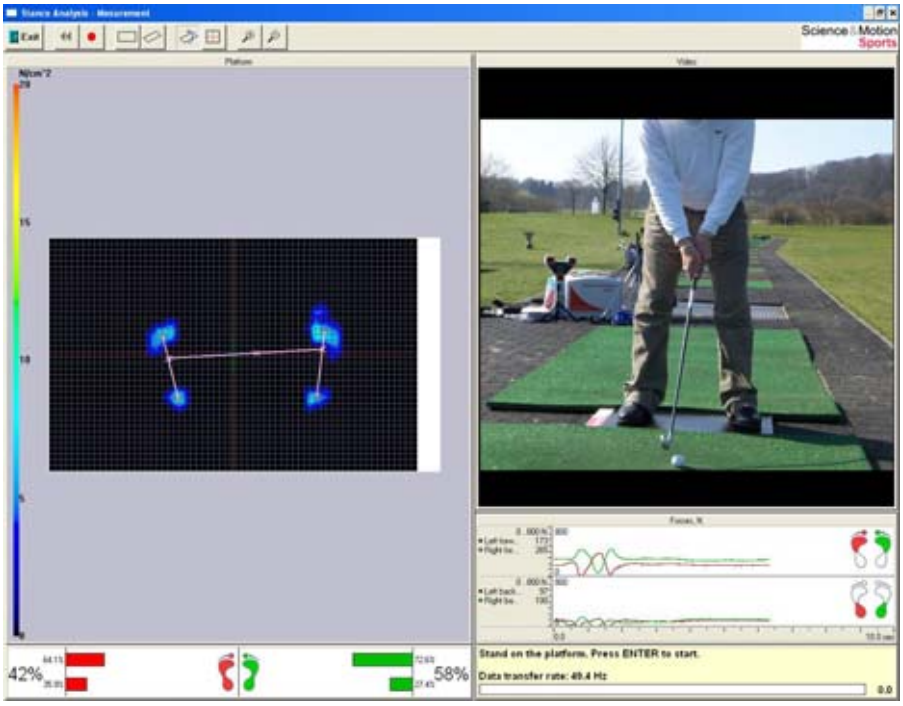
6. Your computer confirms the successful calibration with a short beep signal sound. The system is now ready to do a measurement.

7. Check video signal

   You should already see a live video display in the right area of the program screen. If not, please check if your camera is connected and in operation mode.

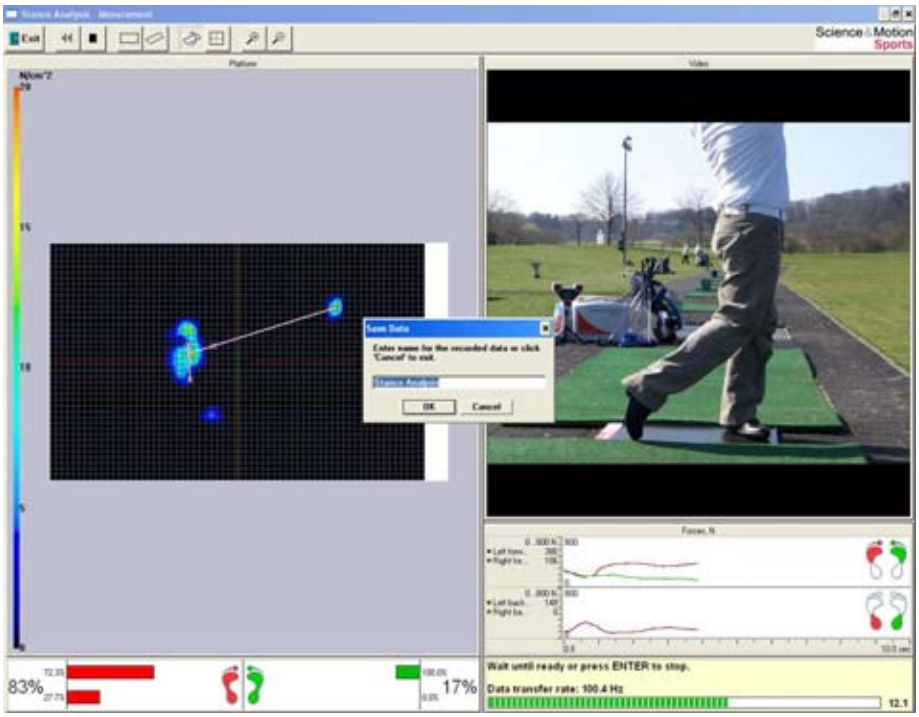
   If you cannot get the camera to work check the video settings and refer to your camera manual.

8. Step on the SAM BalanceLab and press the "ENTER" key to start the measurement.



9. Do your golf stroke.

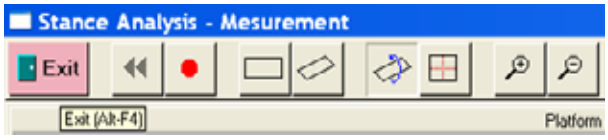
10. Press the "ENTER" key again to stop the measurement or wait until the measurement stops automatically.
Enter a name for your record at the appearing "Save Data" dialog box and press the "OK" button.



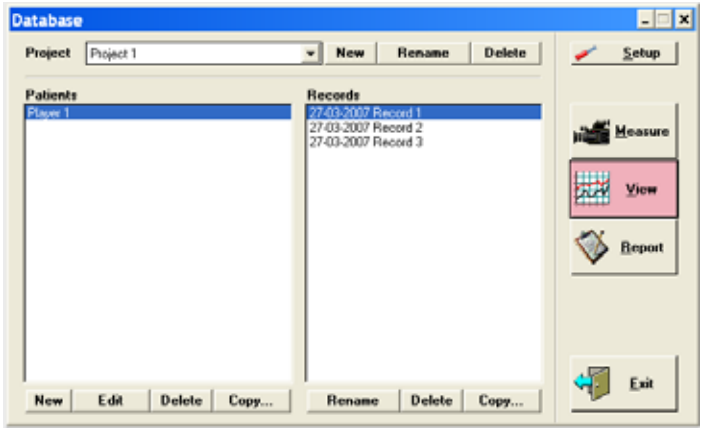
10. Your computer will play a short "beep" sound to indicate that the data was saved successfully and that the system is ready to do further measurements.

Step 4: Review measurements

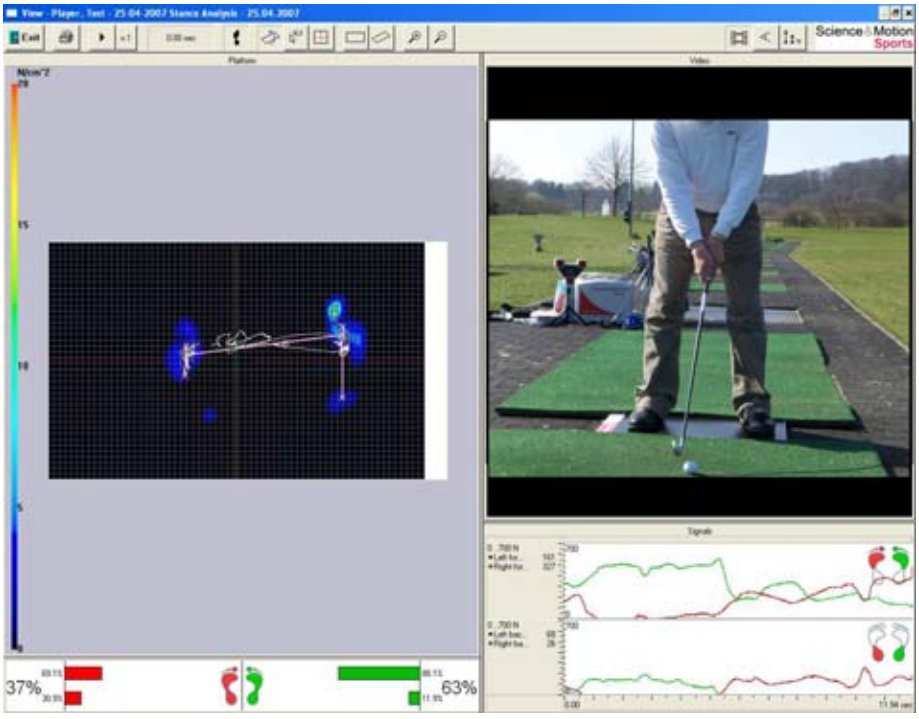
1. Exit the "Measurement" window by pressing the "Exit" button at the upper left corner of the measurement window.



2. In the main program screen choose a record from the "Records" list and press the "View" button.



3. Press the "ENTER" key at your computer to start / stop the replay or use the "Play" button at the upper left. While stopped you can also navigate through the replay step by step by moving the dotted line at the right frame.
See the SAM BalanceLab manual for further details how to review force and video data.



Step 5: Check video synchronisation

In case you do not have a camera with external audio/microphone input channel and cannot use the Audio-Sync feature you will have to do a manual synchronization of BalanceLab force data recording and video recording. Also if you use the Audio-Sync feature, it is important to check if the video is synchronized to the force data.

1. Start the SAM BalanceLab software.

2. Be sure your video camera is connected and you have done the Video Setup as described on page 1.

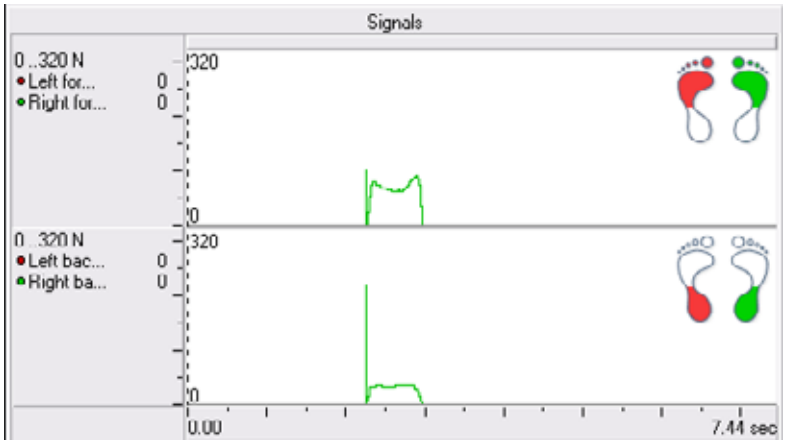
3. Start a new measurement including video recording like described in the Quick Start Guide or in the manual.

4. Adjust the camera so that the full surface of the BalanceLab is included in the camera view.

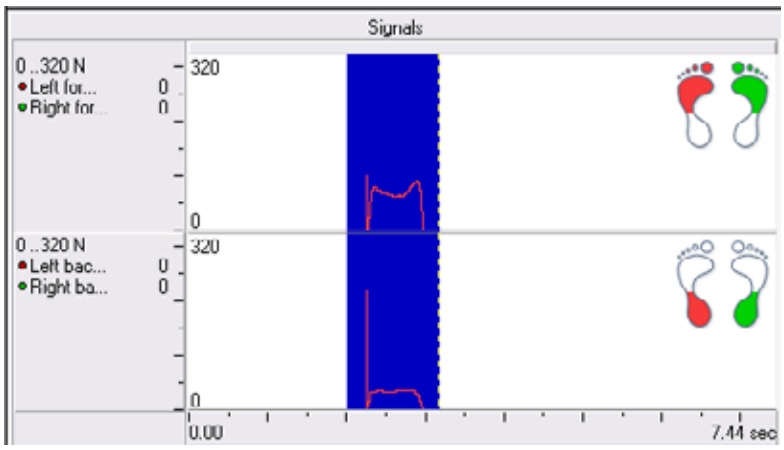
5. Start a recording and just punch the surface of the BalanceLab with your fist like shown in the sequence below:

6. Stop the recording, close the recording window, and open it in the View mode (see page 9: Review measurements).

7. In the "Signals" section on the lower right you should see something similar to the following picture: the signal peak will be time where you fist pressed onto the BalanceLab surface.



8. Select the signal peak in the view by clicking the left mouse button before the peak begins. Release the mouse button and hold down the "Shift" key. Then move the mouse to a position slightly after the peak and press the mouse button again (by still holding the "Shift" key).
   The selected are should now be marked in blue color.

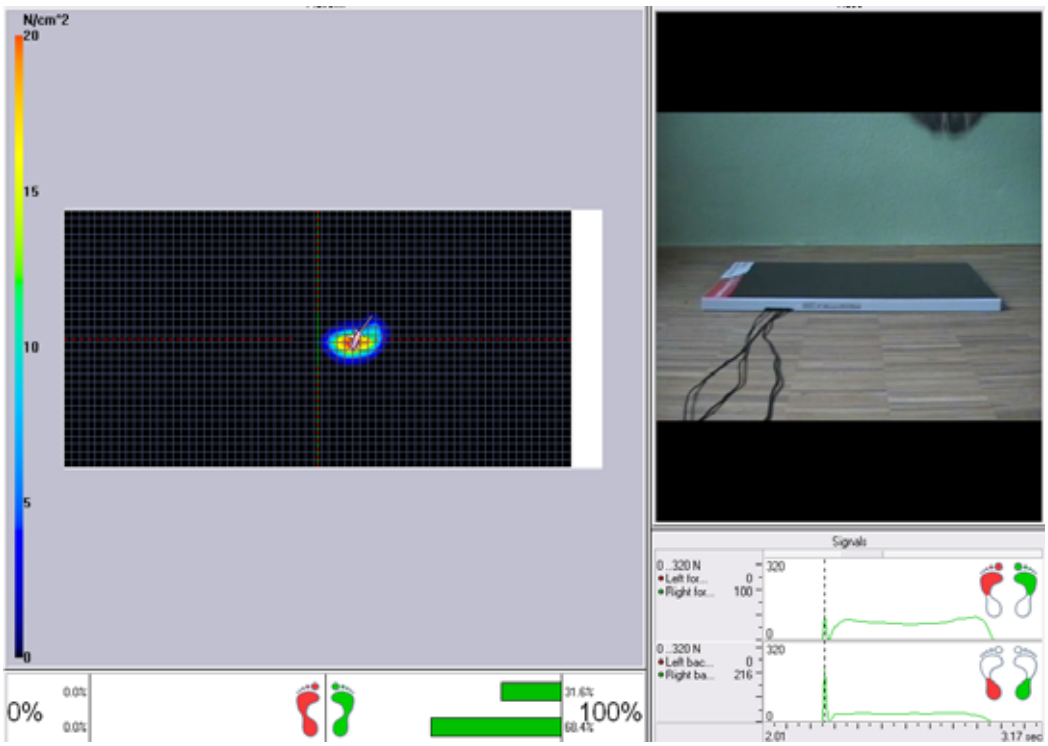


9. Press the "Zoom in" icon in the toolbar on the top: 

   The selected part of the signal should now be "zoomed" to the viewable area.

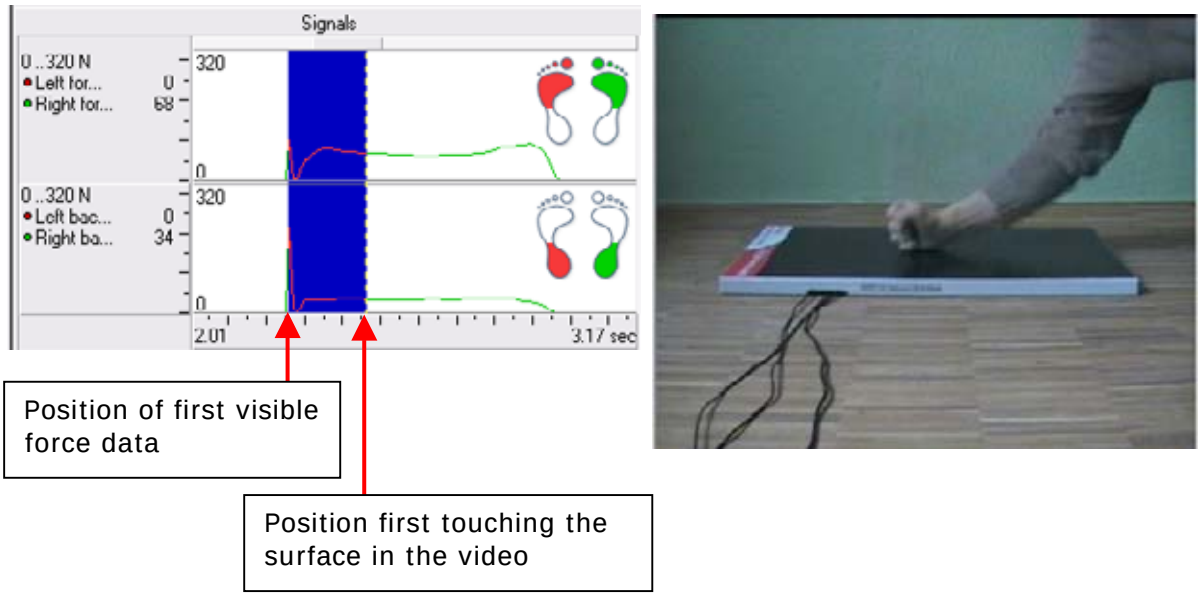
10. Set the position cursor to the beginning of the signal peak:

    - move the mouse cursor to the beginning of the peak
    - click left mouse button
    - the dotted vertical line is the current position, the video and the force data window will show exactly this position now
    - use the arrow keys (left/right) to move the current position until you see the first force signal in the left window. This should be exactly the time where your fist touches the surface.



11. Detect the video offset:

a) Be sure the position pointer is still on the beginning of the signal peak
b) Press and hold the "Shift" key
c) Move the position pointer to the left or the right using the arrow keys until you see the fist just touching the surface in the video window (keep the "Shift" key pressed, otherwise the initial position will change!)
d) When you are on the right position release the keys
e) You should see the following:
   - in The video window the fist touching the surface
   - in the force signal window a blue marked area – this is the video offset time



12. Correct the video offset

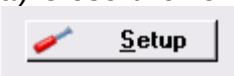
Having marked the offset in the "Signals" window you can see the offset value in seconds printed on top of the window:

This value in the example means there is an offset of 0.2 seconds between the video data and the force data.
- if the offset value is positive the video is late against the force data
- if the offset value is negative the video is early against the force data

You have to remember this offset value and have to enter it in the video setup sequence.
So remember the value now (write it down).

Enter the value in the video setup process:

a) Close the review window and in the main click the "Setup" button:

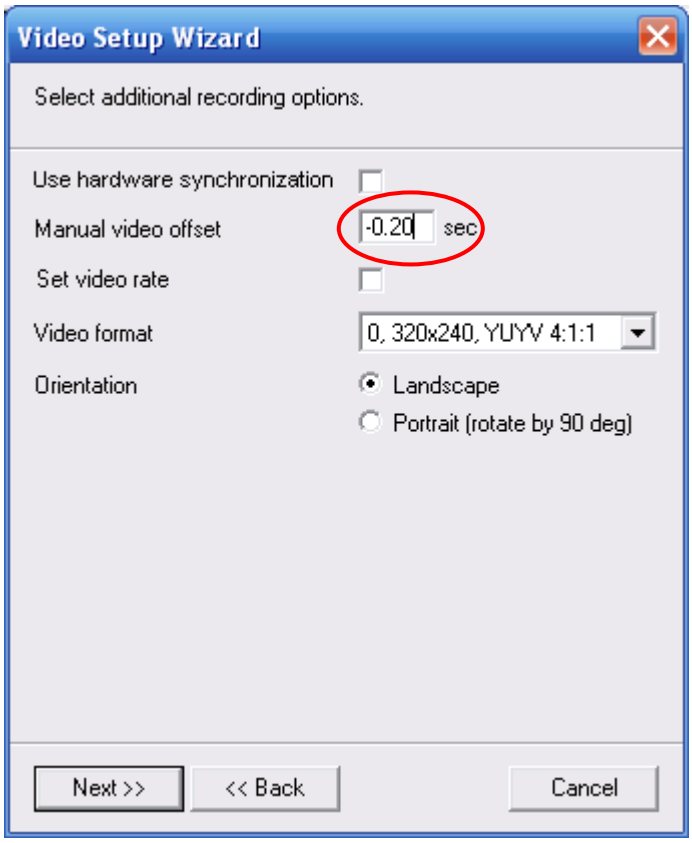


b) Press the settings button in the "Video Capture Device" section:

c) In the next window select your video device and press the "Next" button

d) Enter video offset value

The next window will have a "Manual video offset" input field:



Enter the value in negative way:
If the offset value you found is +0.20, then enter –0.20.
Use always a point as decimal separator, not a comma!

Depending on the video camera you use the dialog may be look different, if the option "Use hardware synchronization" is displayed be sure to have this unchecked to use the manual synchronization!

Press next and go through the further pages of the setup procedure.
After finishing this your video system should be synchronized to the force data.

To be sure that the data is synchronized it is recommended to repeat the process of detecting the offset. The offset should now be in range of one video image, for a normal camera this would be 0.03 to 0.04 seconds.
If you change your video equipment you have to repeat the complete offset correction process! The settings are only valid for the camera used during this correction process.

Appendix 1: Installing MPEG-4 Video compressor (codec)

If the recommended video compressor "Microsoft MPEG-4 Video Codec V2" is not available on your system you can install it from the BalanceLab installation CD now.

Follow the step by step instructions:

1) Insert the BalanceLab installation CD into your CD drive
2) Go to the folder "Video"
3) You find a file called "mpeg4fix.inf" (the extension may not be displayed depending on your system settings)
4) Click with the right mouse button on the file and choose "Install"
5) If a "driver certification warning" comes up, press continue
6) Repeat the Video Setup like described in Step 2 of this document to select and activate the new compressor.