

Science & Motion Sports

SAM BalanceLab

System Installation & Short Manual

This document describes the software / hardware installation process and the main features of the system.

Please follow the sequence of the steps to avoid problems during installation. Science&Motion Sports provides further documentation on the website as video clips.



After opening the box in which SAM BalanceLab was shipped, compare the package contents with the illustration on the picture on page 1 ([chapter 1](#)).



The original surface of the system is designed for indoor usage with sports shoes. Never use the system if damp or humidity is on the surface or on the player's shoes.

There is a danger of slipping for the player in that case.



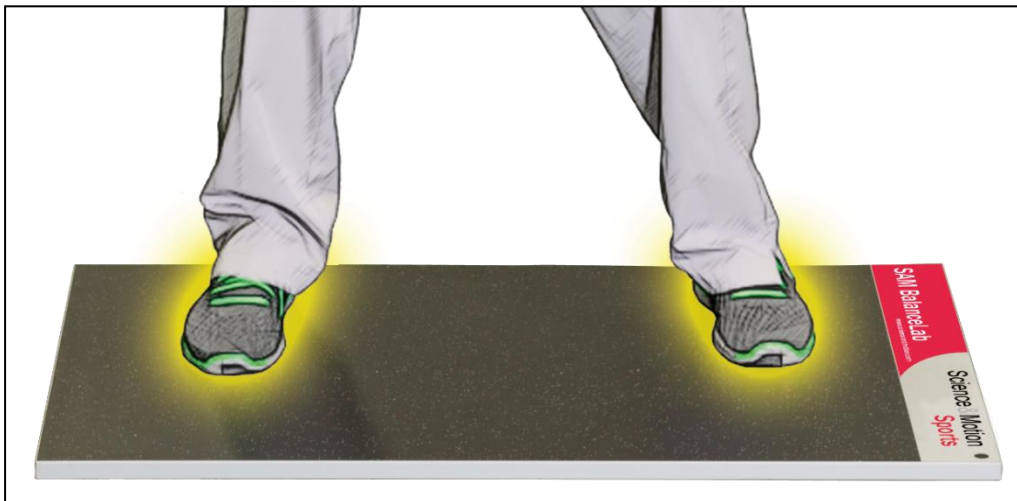
Never step on the plate with golf shoes with hard spikes!

This can damage the surface and the underlying electronics!

SAM Sports provides a covering mat for usage with spikes or outdoor usage. Please contact us if you need it.



Please also read the [Further Safety Warnings \(chapter 13\)](#).



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1. Delivered items check

Check if all delivered components are available:



1. Power supply
2. Screw driver
3. USB connection cable
4. Microphone cable
5. Microphone (delivered item can look different)

2. System requirements – please read before installing

BalanceLab 3 includes a high performance video recording engine for recording and realtime processing of video.

A highly important aspect for balance data in combination with video is that both data streams are synchronized as good as technically possible. This will be achieved by frame by frame video recording. Each frame (video picture) will be synchronized with the balance data. This needs a sufficient CPU performance during the recording process.

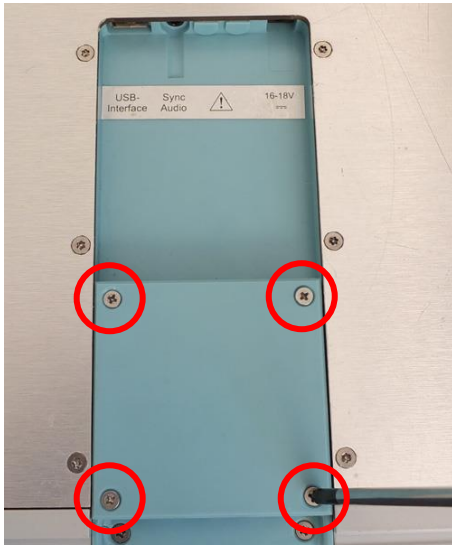
Please see the following table for detailed system requirements.

	Minimum	Recommended
CPU	i5 or i7 DUAL core CPU	i5 or i7 QUAD core CPU
Graphics	Dedicated graphics card or latest Intel onboard graphics DirectX 9	Dedicated graphics card DirectX 9
Memory	>= 4 GB	>= 8 GB
Harddisk	> 50 GB free disk space	>100 GB free disk space
Windows versions	Windows 7 / 8 / 8.1 / 10 (Windows XP is not supported!)	

If your system does not meet the requirements you can try to install the software and eventually limit the camera performance. E.g. lower resolution like 640x480 pixels and lower frame rate <50 FPS.

If you search for an ideal system please look for i5 or i7 CPUs with the appendix HQ, MQ or QM (real Quad core systems).

3. Hardware Installation



1. Turn the balance plate upside down carefully.
2. Unscrew the screws of the connection port with the delivered screw driver.



Depending on your model the number of screws can be 2 or 4.

3. Remove the cover plate.



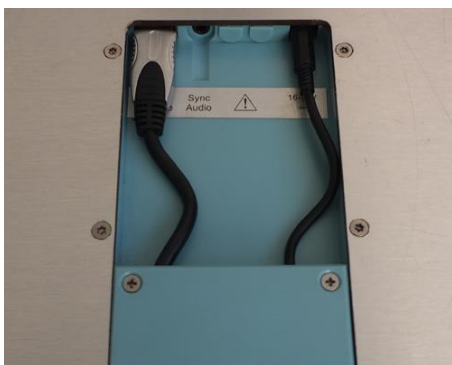
4. Connect the USB cable to connector 1.
5. Connect the power supply to connector 2.



Press the cables carefully into the slits to fix them.



After connecting all plugs please be sure that all cables are pushed completely into the sockets and the plugs are still in place.



6. Place the cover plate on the connection port and fasten the screws.



Do not connect the USB cable to your computer now!

First execute the software installation as described on the following pages.

4. Software Installation

First step if you install the software from delivered USB memory stick:

1. Insert the SAM BalanceLab setup stick into the USB port of your computer or laptop.
2. Browse to the content of the memory stick and start the file *Setup.exe*.

First step if you install the software from a download file:

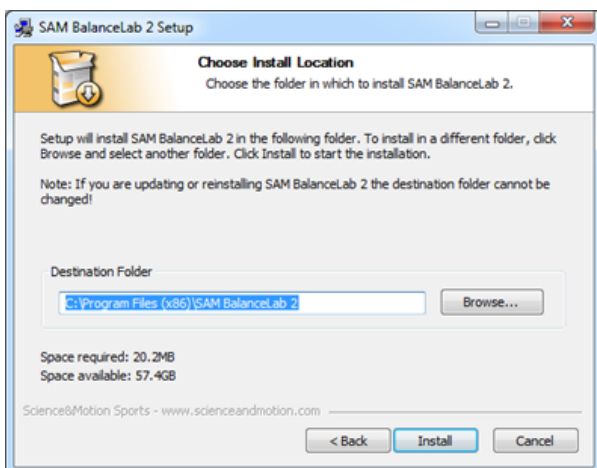
1. If the file is a ZIP file then unzip it to your local disk. Then start the setup executable file.

2. In the first setup screen click the "Next" button to continue.



- ☒ Accept the license agreement by checking the box below the agreement.

3. Click the "Next" button.

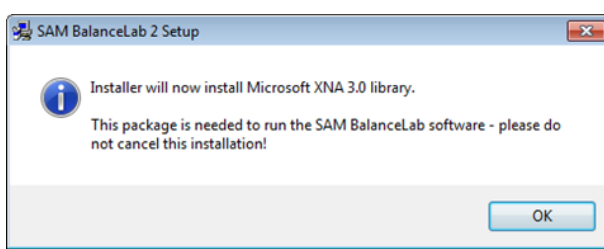


4. Choose a destination folder.
5. Click the "Install" button.



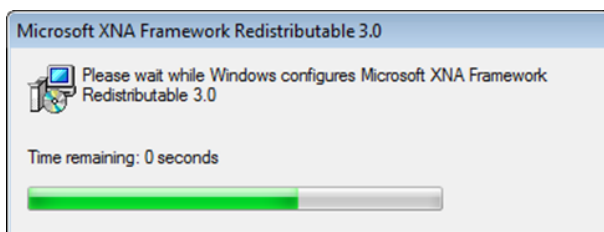
It is recommended to leave the installation folder as given by the installer.

Software Installation

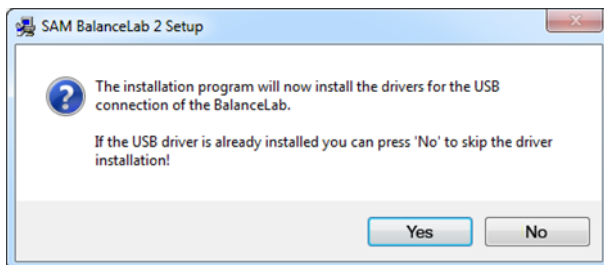


Depending on software already installed on your system Microsoft XNA Graphics software needs to be installed.

☞ If so, you will see the window on the right.



6. Please press OK and do not interrupt or cancel this process!

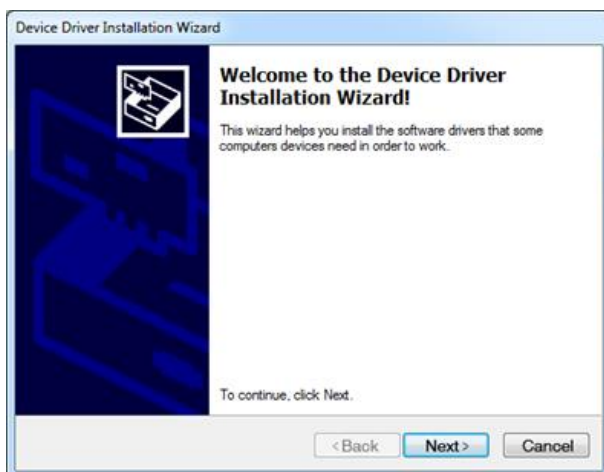


☞ The USB driver installation for the SAM BalanceLab hardware will be installed.

7. Click "Yes" to continue installing the drivers.



If you are sure you have installed the drivers before and the system worked you can skip the driver install by pressing "No".



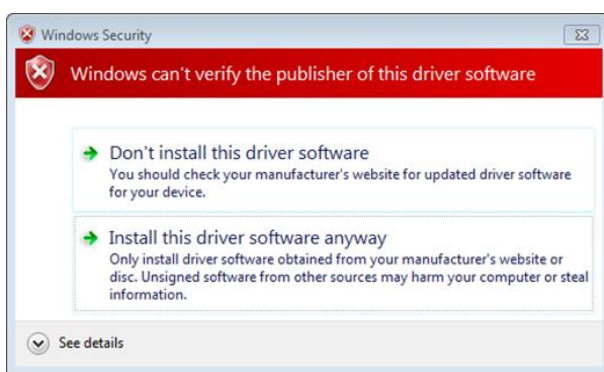
☞ For driver installation Windows will open a "Device Driver Installation" window.

8. Click the button "Continue" (depending on the operating system and service pack this screen may vary or will not appear).

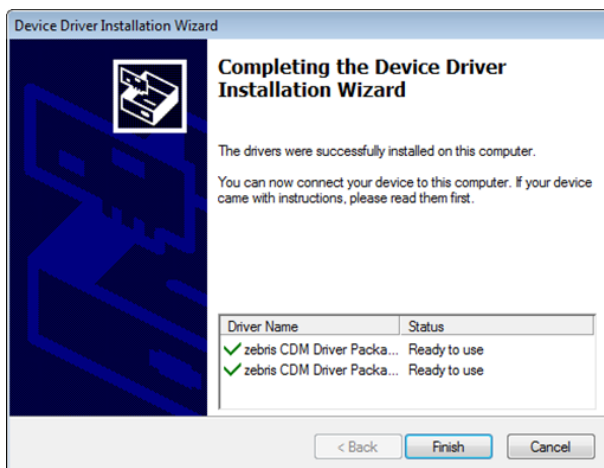


Be sure to always select "Continue" or allow processing, never press "Cancel"!

Software Installation



If you see warnings like on the right be sure to ALWAYS continue the driver installation. Click on "Install this driver software anyway"!



After the driver installation is finished you may see a message like displayed on the right. This message may vary depending on the Windows version you use.



After installation is finished you will be prompted to attach the SAM BalanceLab to your PC / Laptop.

9. Connect the SAM BalanceLab via USB cable to a free USB port on your PC / Laptop.

Software Installation



➡ Your computer will notice a newly attached device and the Windows “Found new Hardware” process will start.

Depending on your windows version the process will run silently or display messages like displayed on the left.



Under no circumstances cancel the Hardware-Wizard while Windows configures your system!



10. If the "Found New Hardware Wizard" asks you how to install the Software, choose to install the software automatically.

11. Click the "Next" button to continue.



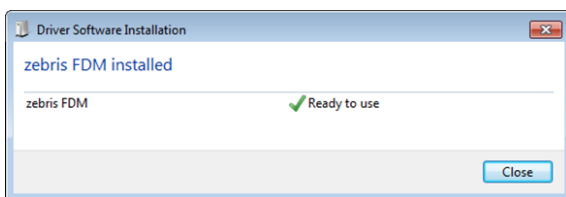
Windows may inform you, that the device has not passed the Windows Logo test. Click "Continue Anyway" to continue with the installation.

Software Installation



12. Click "Finish".

- ☞ The Windows Hardware Wizard will close.



- ☞ On Windows 7 or later systems the final message will look like the screen shot on the left.



The installation window is still open.

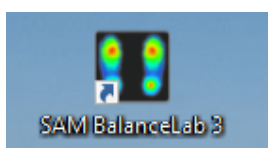
13. Click the "Close" button to complete the software installation of SAM BalanceLab.

14. Remove the SAM BalanceLab setup stick from your USB port.

5. Start the software, create project and player



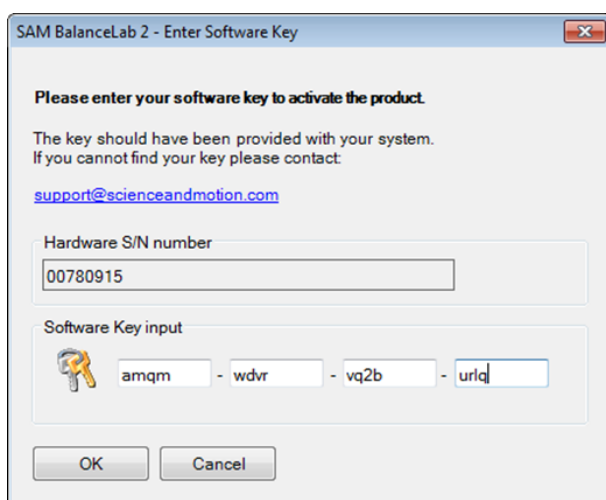
Be sure to have the BalanceLab connected to a USB port on your computer before you start the software. Also the power plug must be connected. If all connections are fine the LED light on the plate is permanently green. If the LED is off then probably the system is not powered. If USB connection is not established or USB drivers are not installed the LED will be blinking green.



1. To start the "SAM BalanceLab 3" double click on the desktop icon which was created during software installation.



You can also start the software through the Windows start menu:
>"Programs">"SAM BalanceLab 3"



- ☞ You will be prompted to enter the software key printed on the software key document or provided to you by email.

2. Type in the key.
3. Press the "Ok" button.



The key which is provided to you is a unique key for your product. Keep it in a secure place.



- ☞ You see the main program screen.

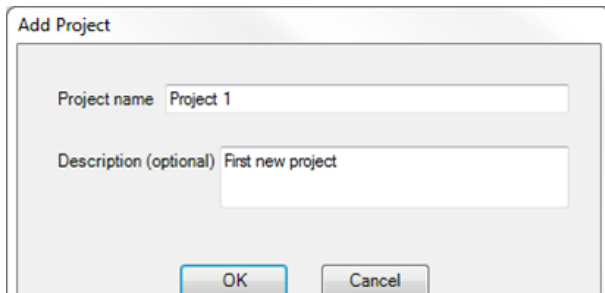
4. Click the "add" button in the upper middle part of the "Projects" window to create a new Project (after installation there is only the Examples Project available which should not be changed).



Projects can hold an unlimited number of Players and help

Start the software, create project and player

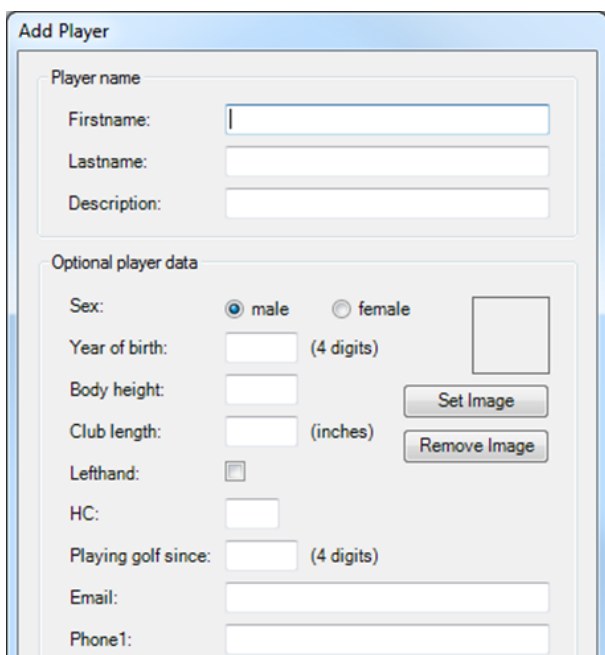
keeping the data organization concise.



The "Add Project" dialog box contains two text input fields. The first field is labeled "Project name" and contains the text "Project 1". The second field is labeled "Description (optional)" and contains the text "First new project". At the bottom of the dialog are two buttons: "OK" and "Cancel".

☞ A window "New Project" will pop up.

5. Enter a name for your project. Optionally you can add a short description text.
6. Click the "OK" button.



The "Add Player" dialog box is divided into two sections. The top section, "Player name", has three text input fields: "Firstname:", "Lastname:", and "Description:". The bottom section, "Optional player data", contains several fields: "Sex:" with radio buttons for "male" (selected) and "female"; "Year of birth:" with a text input and "(4 digits)" label; "Body height:" with a text input; "Club length:" with a text input and "(inches)" label; "Lefthand:" with a checkbox; "HC:" with a text input; "Playing golf since:" with a text input and "(4 digits)" label; "Email:" with a text input; and "Phone1:" with a text input. To the right of these fields are two buttons: "Set Image" and "Remove Image".



7. Click the "add" button in the Players section to create a new Player.
☞ The "Add Player" dialog will open.
8. Please enter all desired data. At least the last name has to be entered.



If you want to send reports by email it makes sense to enter the email address into the player data when creating a player.

9. Press "Save" after data input is finished.

6. Do a first recording



The surface of the system is designed for indoor usage with sports shoes.

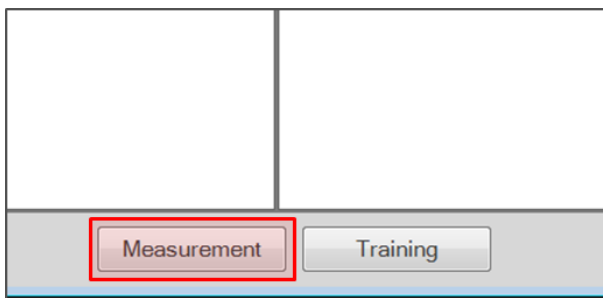
Never use the system if damp or humidity is on the surface or on a player's shoes!

Never step on the plate with golf shoes with hard spikes!

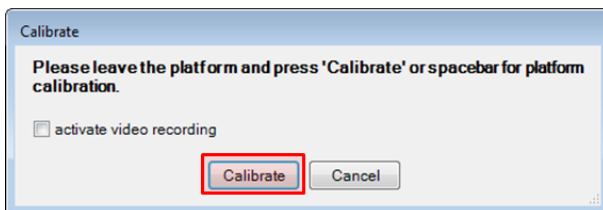
There is a danger of slipping for the player in that case.

Science&Motion Sports provides a covering mat for usage with spikes or outdoor usage. Please contact us if you need this.

6.1 Start a measurement



1. Click the "Measurement" button at the bottom of the "Main" window.



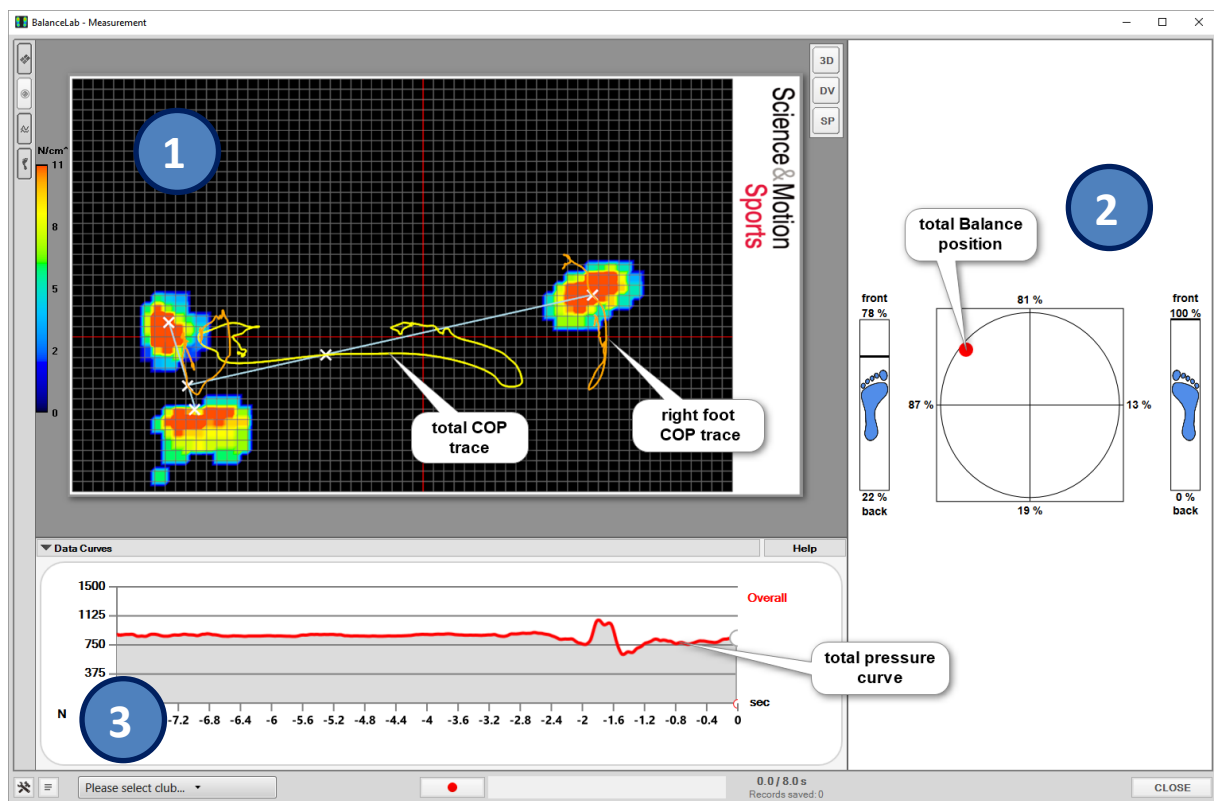
- ☐ In the "Calibrate" window leave the "activate video recording" checkbox unchecked for now.



Be sure nobody stands on the plate.

2. Press the "Calibrate" button.
 - ☞ Calibration will take some seconds. Then the Recording window will open.

6.2 The recording window (measurement / training)



1

When the software enters the "Measurement" window the live pressure distribution is shown in the platform view window.



You can switch between 3D and 2D mode by clicking the "2D" button in the upper right corner of this window.

2

The window on the right shows the "Balance view". This graphic shows the pressure distribution of the body in percent.

The red dot is the actual pressure center, the values around the box are showing the percentage of pressure on the left/right foot and to the front or back.

Inside the feet on the left and right the black line marks the actual pressure distribution for this foot (to heel or toe).

Do a first recording



To get right values here it is very important to have the separation lines set properly. The lines are displayed in red on the pressure plate view and separate the left and right foot and also the front / back. The vertical line has to be positioned in the center between the two feet. The horizontal line should be set between the toe and the heel area of the feet (center of feet).

How to set the separation lines:

1. Press the "SP" button in the pressure plate view or press the "F3" function key.
2. Click with the mouse into the view to set the lines – the mouse position will define the center point of the cross.
3. To go back to the normal view press "F3" key or button again.



The window below the pressure plate view shows the actual pressure values as a curve. You will see a history of some seconds into the past.




With a right-mouse click into this window the curves can be displayed for total pressure or pressure separated for feet or front / back.

6.3 Starting the recording



Start the recording

The Recording button  on the bottom area of the window will start a recording.



Recording time is 8 seconds by default – the progress is displayed in the progress bar.

Stop the recording manually

Click again on the recording button  .



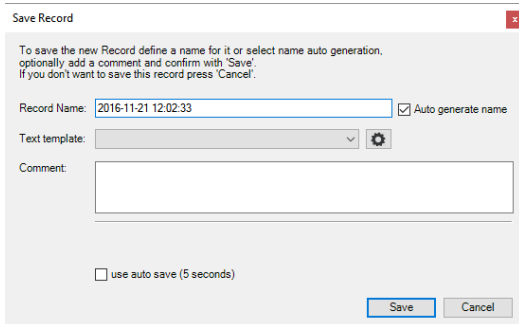
Start/stop of a recording can also be done by pressing the spacebar.

Do a first recording

Make a recording

1. Start a recording.
2. Do a golf swing movement.
3. Stop the recording.


Save a record



Save Record

To save the new Record define a name for it or select name auto generation, optionally add a comment and confirm with 'Save'. If you don't want to save this record press 'Cancel'.

Record Name: 2016-11-21 12:02:33 ☒ Auto generate name

Text template: 

Comment:

☐ use auto save (5 seconds)

Save Cancel

☞ After a recording is finished you will be asked if you want to save the record:




If "Auto generate name" is checked the name of the record will be the current date/time.

4. You can add text after the auto text or delete the default name and enter your own text.



If you check the option "use auto save" records will be automatically saved with auto name (no confirmation needed).

5. Press "Save". It is possible to do multiple recordings just by clicking again on .



All recordings done in one row will be added to one data session.

CLOSE

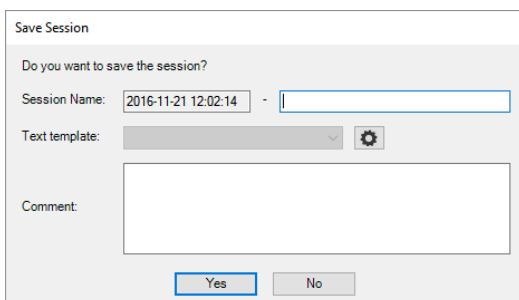
Finish the recording

6. Press the

CLOSE

 button.


Save the session



Save Session

Do you want to save the session?

Session Name: 2016-11-21 12:02:14 -

Text template: 

Comment:

Yes No

☞ If Records are available you will be asked if you want to save the Session. The Session will include all your recorded data.

7. You can add a Name for the Session and optional also a comment which will be displayed in the Main Window to better identify or remember your recordings.



If you press "No" all recorded data will be rejected!

7. Automatic recording by hit detection

The BalanceLab 3 software now supports automatic hit detection to control recordings.

The usage of automatic recording mode has some important advantages:

- No need to operate keyboard or mouse for recording start/stop
- The recording will be done with a pre-defined timing, so you can avoid producing very long recordings. This will save a lot of disk space as the video files will be much smaller.
- The moment of the impact will be detected and automatically set as Impact event in the BalanceLab software. All other events like Start, TOB, Delivery, Follow Through can also be set automatically to fixed timing (optional). This will allow quick analysis of recordings without having to edit the data before.

There are three options available to achieve hit detection:

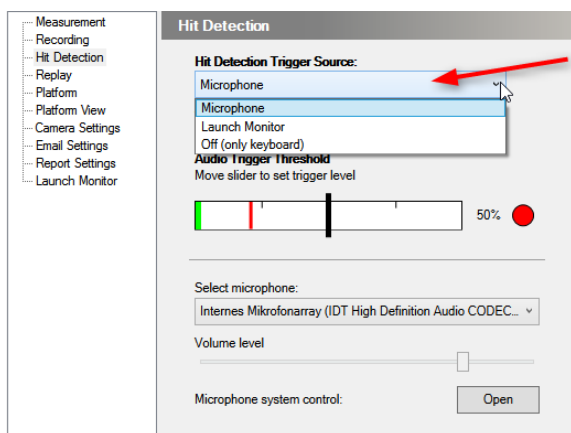
- by microphone (audio trigger)
- by Launch Monitor (only available if Launch Monitor plugin is activated)
- by Keyboard (spacebar key must be pressed in moment of impact)

In this manual the hit detection by microphone is described in detail.



You can use the provided microphone or any microphone that is compatible with your computer / Windows system

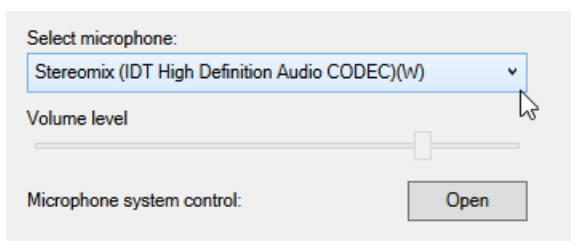
7.1 Configuration of microphone



1. To configure your system for automatic hit detection click on the settings button in the main software screen (lower left corner) and then select Hit Detection.
2. Select "Microphone" as *Hit Detection Trigger Source*.



If you select the option "Off" you can simulate the trigger by pressing the spacebar key in the moment of ball impact.

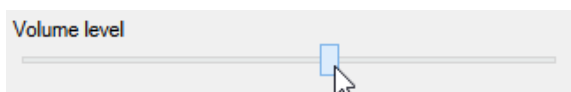


3. Select the microphone that you want to use for the impact detection.



All connected microphones should be listed. If you want to test if the right one is selected you can check the audio signal in the live display.

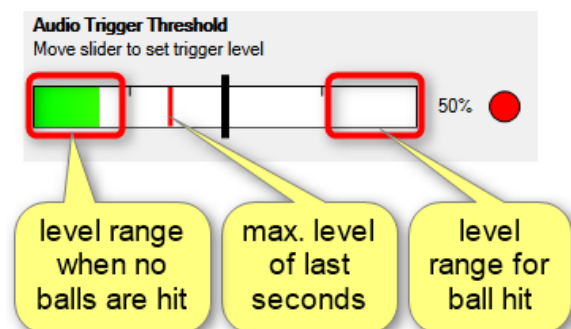
Microphone signal live display:



4. Set the general level of the microphone.

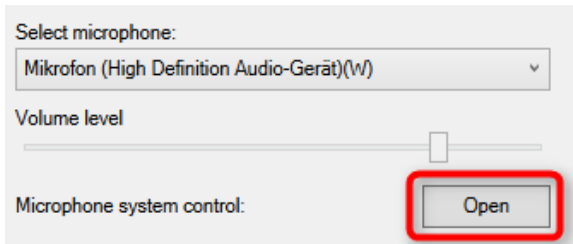
Please use the *Volume level* slider adjust the level like follows:

- when no balls are hit the level should be lower than the first segment of the bar
- when a ball is hit the level should be at least in the last segment of the bar

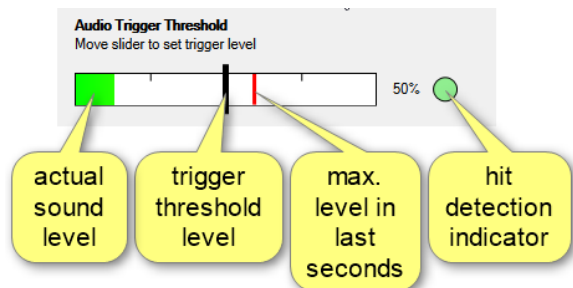


The red line in the bar shows the max. level of the last seconds, so this is a good indicator when the live display is flickering too much.

Automatic recording by hit detection



If the level cannot be set with the Volume level slider you can try to use the Windows audio settings. For some microphones additional options like "level boost" are available.



5. Set the level for hit detection

The black line is a slider to set the threshold level for hit detection. Once a sound is louder than this level, a ball hit will be detected and a recording will be started.

To simulate a ball hit you can clap your hands and watch the sound level. The red line indicating the max. sound level should be above the black line after each clap. If this is not the case adjust the black slider bar accordingly (click and hold with mouse).



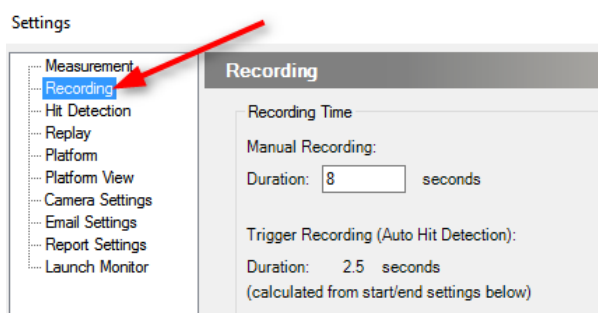
There is a separate indicator that shows green for every detected hit. So adjust the level until you get a green indicator for every clap or hit you do.

7.2 Further configurations for Auto Hit Detection

In BalanceLab 3 recordings can be done automatically by using a microphone for swing detection (impact trigger).

You can use the provided microphone or any microphone that is compatible with your computer / Windows system.

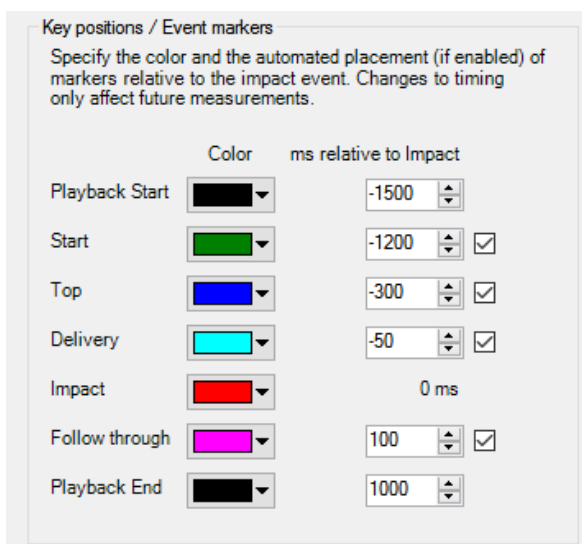
Automatic recording by hit detection



In the Recording page of the program settings further options for automatic hit detection can be configured.

This are mainly the swing key position markers (Events) and the total recording duration.

The recording duration for manual recordings controlled by Start/Stop commands via keyboard (spacebar) can be set in the following "Duration" field. This value will not be used for automatic recording mode.



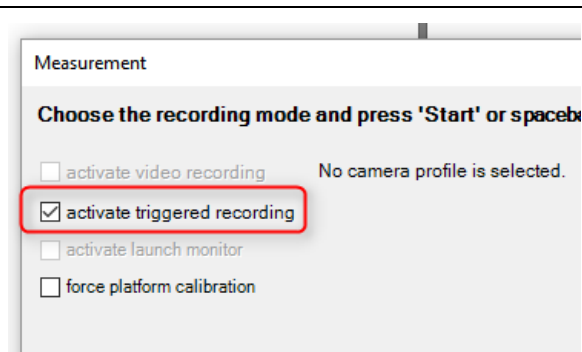
The recording time for recordings done with "Auto Hit Detection" is defined automatically by the timing of the event markers **Playback Start** and **Playback End**. Both values are relative to the impact and define the length of the recorded data. In case of this example the length will be 2.5 seconds (1.5 seconds before impact and 1 second after impact).



For all event markers a timing relative to Impact can be defined. All key position markers with a checked box will be set automatically when:

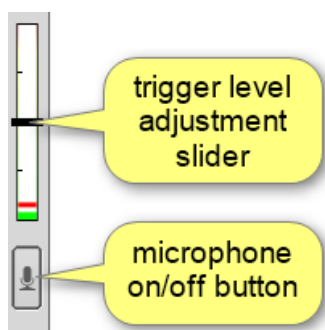
- Auto Hit Detection mode is active
- Impact Marker is set in Replay and the key "M" is pressed. This will set all other markers relative to impact with the given timings. If you move the Impact marker you can always correct all other markers by pressing the "M" key.

7.3 Using the microphone for recording



After configuration of the microphone and Recording settings the "Triggered recording" can be used when starting a recording.

To do this check the box "activate triggered recording" in the recording startup window.

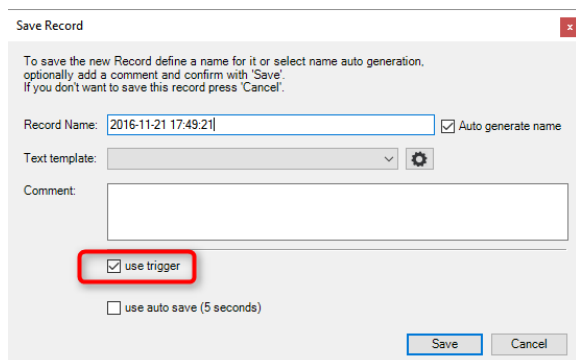


On the left edge of the recording window you will see a live display for the microphone sound level (in case microphone is activated).

☞ Every time the sound level exceeds the black line a recording will be initiated.

There are two options available here besides checking the activity of the microphone:

- a) temporarily deactivate the microphone by clicking the microphone on/off button.
- b) adjust the trigger level for hit detection if needed.



☞ In case permanent unwanted recordings are executed due to wrong trigger level or loud environment you can deactivate automatic recording also in the "Save record" window.

8. Calibration of foot positions

8.1 General information

To get correct values for player balance results it is important that the footprints of the player in Setup position are properly separated into the following four segments:

- Left foot (horizontal separation)
- Right foot (horizontal separation)
- Front/back for left foot (vertical separation)
- Front/back for right foot (vertical separation)

As the players have different preferences the calibration needs to be adjusted for most of the players.

Two examples for different player stance with correct calibration:

	<p>The stance of this player is slightly open to the target, which means the left foot position is more shifted to the top of the plate.</p> <p>In this case the separation lines for left and right foot have to be set to different positions (1,2).</p> <p>Line 3 separates left and right foot.</p>
	<p>Stance is straight for this player, so lines for front/back separation are on the same vertical position (1,2).</p>

8.2 Execute the foot calibration in **ULTIMATE** edition

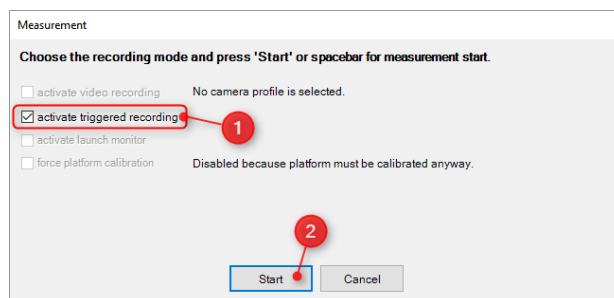
In the Ultimate edition of the software the foot calibration can be used in an automated mode. The following example will describe the process of the automatic feet calibration for recording and replay modes.

8.2.1 Recording mode

Start a measurement by selecting "Measurement" or "Training" in the main window.



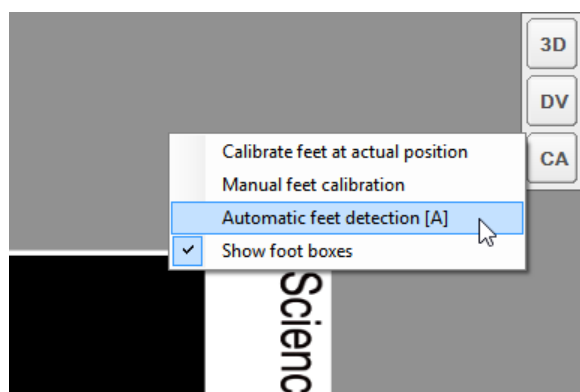
To be able to use the automatic feet calibration the triggered recording mode must be activated (1). See [chapter 7](#) for more information.



Press the start button (2).

In the platform view window click on the button "CA" (calibration).

In the pop-up menu 4 options are offered. Description of the options follows below:



Calibrate feet at actual position

Directly executes the automatic calibration in the moment you click on this option. This option lets you define any desired position for doing the calibration. Recommended position is always the Setup position, so the player should be in this position when the calibration is executed.

Manual feet calibration

If you don't want an automatic calibration or it does not work correctly you can execute a manual calibration as described in [chapter 6.3](#)

Automatic feet calibration

Calibration of foot positions

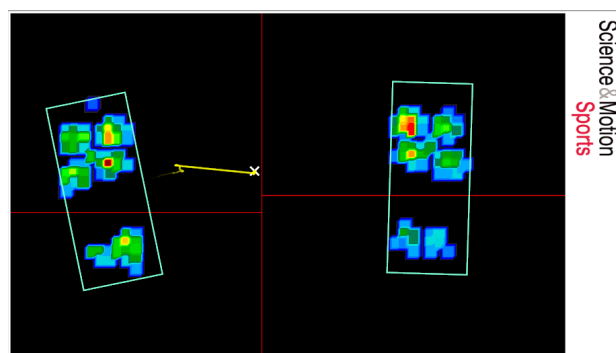
This mode automatically detects when a player stands without moving and will set this position as calibration. Once the swing is executed the last stable position before the impact will be the reference for the calibration. This mode will work "live" without any interaction with the software. After swing recording the calibration will automatically be saved and will directly be available for replay.



Automatic feet calibration will only be available when automatic hit detection is activated (see [chapter 7](#))

Show foot boxes

If feet calibration is done this option will show rectangle boxes around the detected feet. This makes sense to verify the successful calibration.



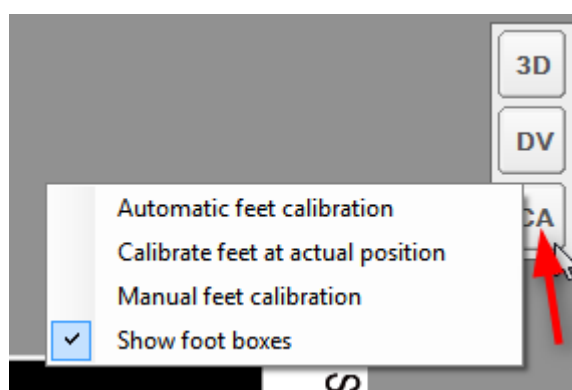
8.2.2 Replay mode

Start a Replay by selecting a data record and then press the button Replay in the main window.



In the platform view window click on the button "CA" (calibration).

In the pop-up menu 4 options are offered. Description of the options follows below:



Calibrate feet at actual position

This executes the automatic calibration at the actual position in the time bar. The footprints actually displayed will be the reference for the calibration.

This option lets you define any desired position for doing the calibration.

Recommended position is always the Setup position (before start of the swing).

Manual feet calibration

If you don't want an automatic calibration or it does not work correctly you can execute a manual calibration as described in [chapter 6.3](#)

Automatic feet calibration

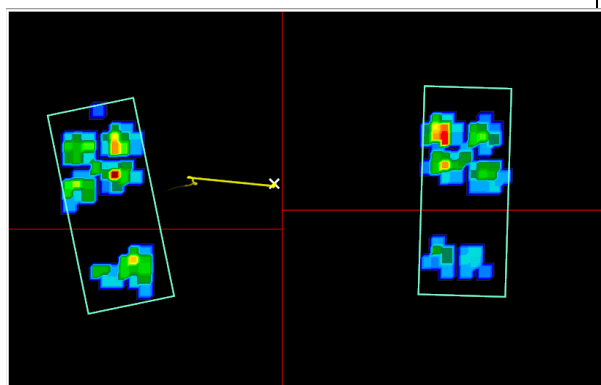
This mode automatically detects the stable setup position before a swing is started. This position will then be the reference for the calibration.



Automatic feet calibration in Replay will only be available when the Impact marker is set.

Show foot boxes

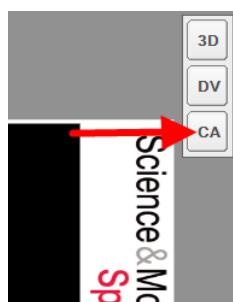
If feet calibration is done this option will show rectangle boxes around the detected feet. This makes sense to verify the correct calibration.



8.3 Execute the foot calibration in PRO edition

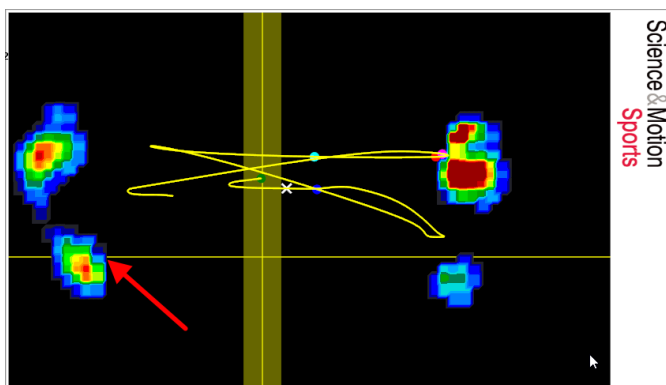
Foot calibration can be done in Recording and in Replay mode. For both operation modes the process of calibration is identical.

In this example the calibration is shown for the Replay mode.



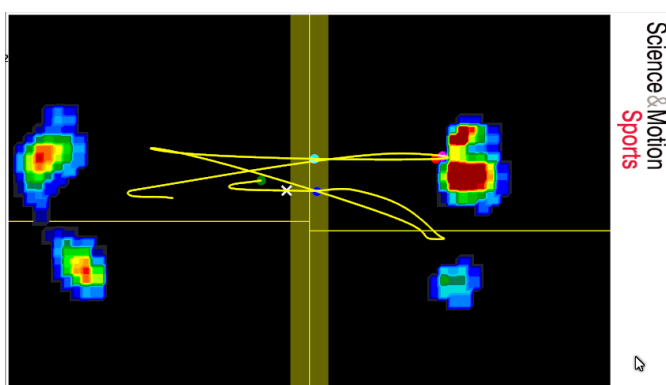
In the platform view window click on the button "CA" (calibration).

The display will change and the separation lines are displayed in yellow color now.



When the CA button is activated the vertical lines can be set by just clicking with the mouse to the right position in the view for the left and right side.

In the example the line for the left foot needs to be re-positioned so that it fits into the center between forefoot and heel area.



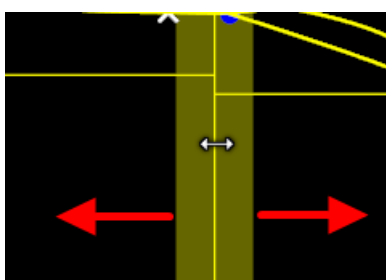
The graphic shows the corrected position. Lines for left and right foot exactly separate forefoot and heel area for each of the feet.

If the horizontal line (left/right separation) needs to be adjusted this can be done by

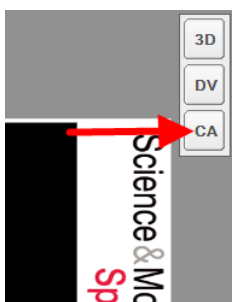


If the footprints do not show a clear separation between forefoot and heel then the separation line should be set to the "best guess" center.

Calibration of foot positions



If the horizontal line (left/right separation) needs to be adjusted this can be done by placing the mouse over the line area and click the left mouse button and drag the line to left or right.

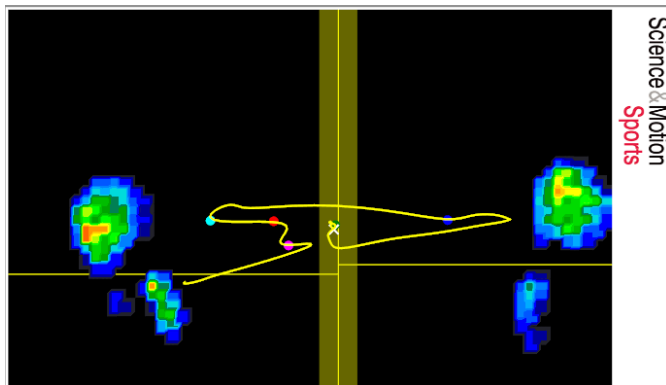


After settings are finished press the "CA" button again to switch back to normal view mode.

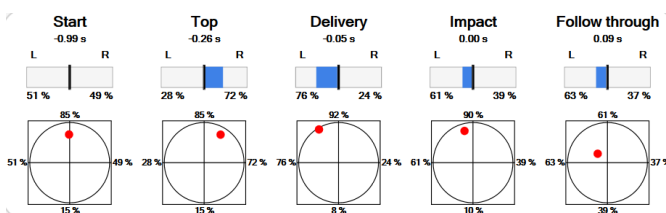


When changes are made to the settings there will be confirmation box appearing on closing of the Replay if the changes should be saved permanently.

8.4 Consequences of incorrect feet calibration

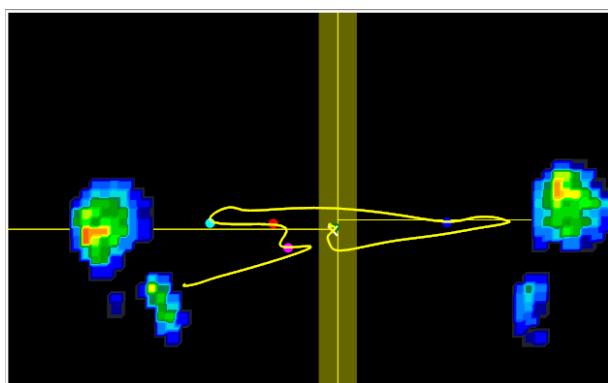


On the left you see a display for a properly feet calibration.



This leads to the following balance values at the key positions (see left).

Calibration of foot positions

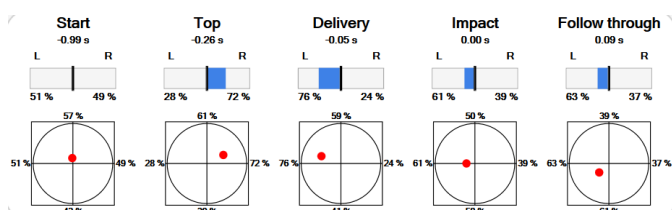


Science & Motion
Sports

In this picture you see the same player with a wrong feet calibration.

Both vertical lines (front/back) are set too much in direction of the toes.

This shifts the balance to the back.



The balance values on the left differ a lot from the right values above in front/back direction.



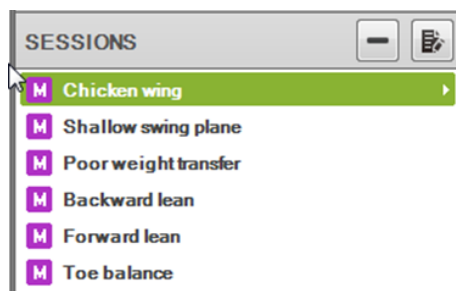
If you use the player balance values for coaching please be sure that the feet separation is correct!

9. Browse and replay data

9.1 Select data for replay



1. Click on the Project "Example Data" in the Projects section on the left.
2. Click on the Player "Common Swing Faults" in the Players section.



3. Click on the first session "Chicken Wing". This will select this session and show the content on the right.
- ☞ In the Sessions section you will see the available sessions for this player.
- ☞ There are 3 sections in the right column, *Info*, *Media* and *Records*.



In the *Info* field shows the comment information for this session. This can be optionally entered directly after recording or at any time later.



The *Media* field contains additional files that can be attached to a session. This can be documents (like PDF) or pictures or any other files.

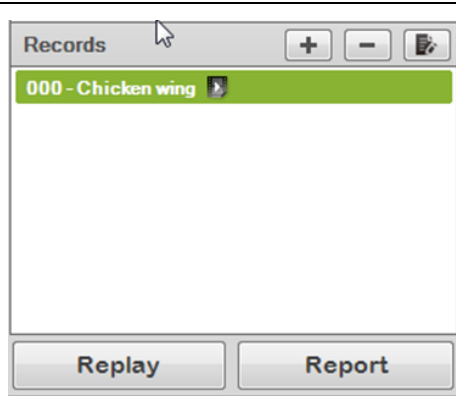


- In this example a Report PDF file and pictures for the swing positions are attached (see left photo).
4. Double click on one file to open it.
 5. Add files by "drag and drop" them to this box.




Files can be added by copying them, moving them or linking them.

Browse and replay data



In the *Records* field the swing records for this session are listed.

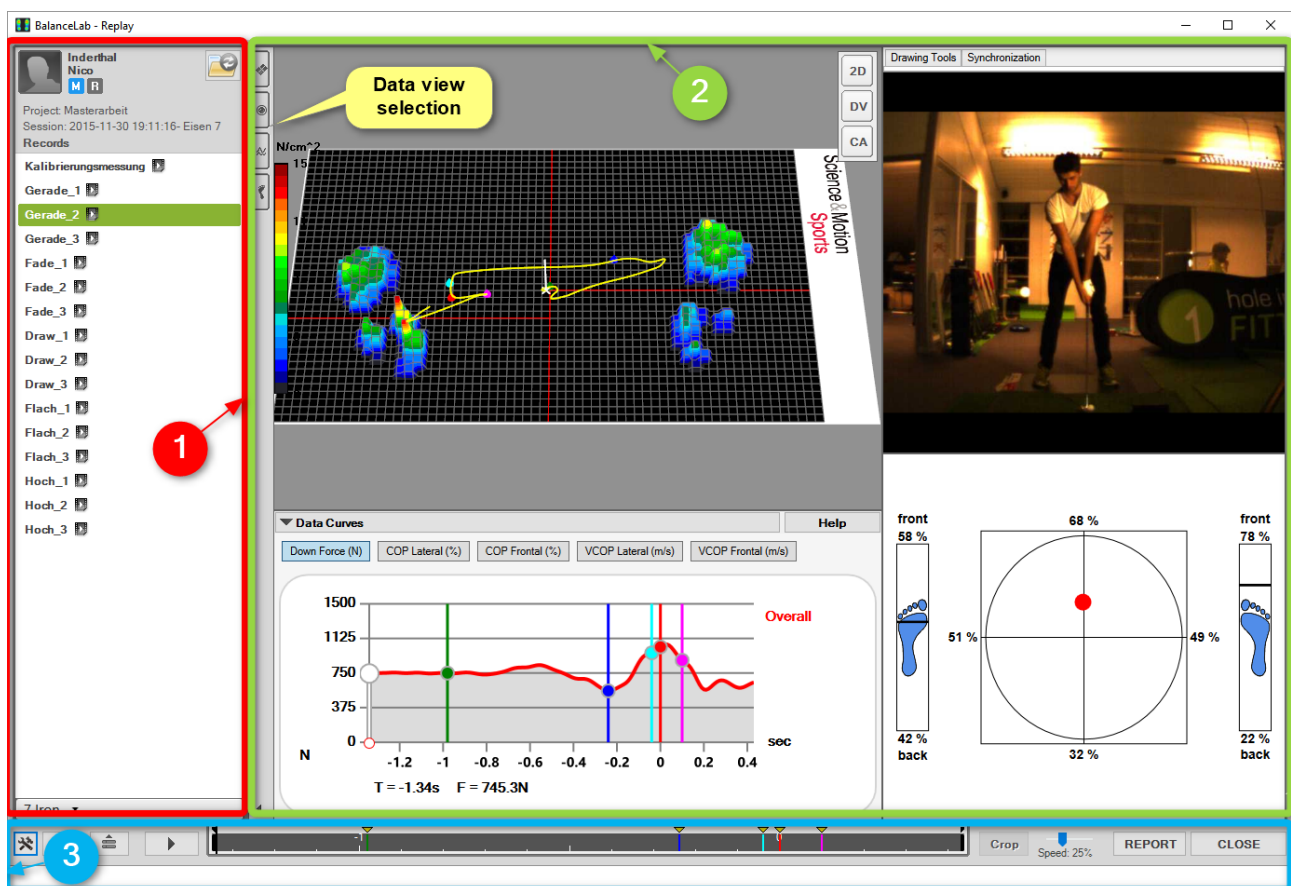


All records with this symbol  contain videos.

6. Double click on the record or click on the "Replay" button to open the selected record in the replay window.
7. Click the "Replay" button to proceed to the replay now.

9.2 The data replay window

9.2.1 The three different functional areas of the replay window



1

Data selection window

In this area you see information about the selected player and data record and you can switch to other data records.

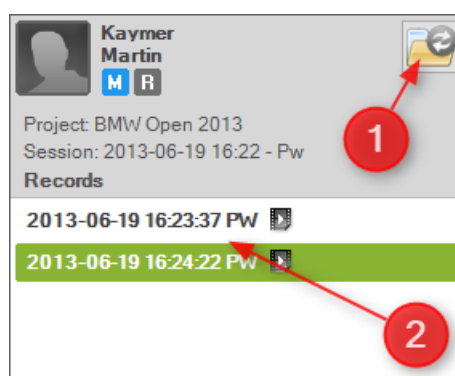
If multiple records exist for the actual Session you will see them listed (2). Another record can be loaded just by clicking on it.

To open record from other Sessions or



Players press the button (1).

A data selection box will open and allow to load any available data.



2

The 4 different data views:



1 Pressure data view

Shows the pressure distribution and COP traces at the actual position.



2 Video view

Shows video if available. Drawing tools can be used to add user graphics.

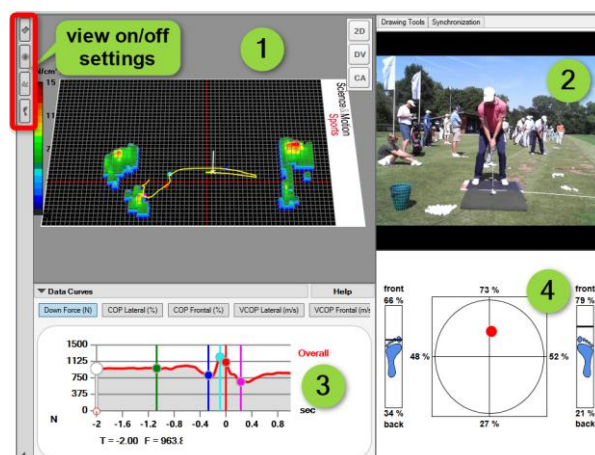


3 Data curves for pressure of body or single feet.

Additional data curves are provided in the ULTIMATE edition.



4 Balance view with current pressure distribution for both feet and total body balance point.



You can use the view toggle buttons to switch each of the data

view windows to visible or not visible.

3

Position control bar for the replay



The bar provides controls to play/stop replay and set actual replay position. Also the markers for the swing key positions can be set here.



The following chapters will describe the features of the data replay windows in detail.

9.2.2 Description of the control elements / navigation bar for the replay



Start

Press the play button  to start the replay.

☞ All data views will show synchronized data in the replay.



Navigation through the data is also possible with the keyboard or mouse.

Navigation with mouse

Place the mouse cursor into the replay bar and press the left mouse button.

☞ The position in the data views will be updated to this position.



You can also use the scroll wheel of your mouse to scroll through the data smoothly.

Navigation with keyboard

The left/right arrow keys will move the position back or forth one data frame (10ms). This allows very precise positioning.



If shift and arrow keys are pressed together position will move 10 data frames (100ms).

Browse and replay data



Slider control

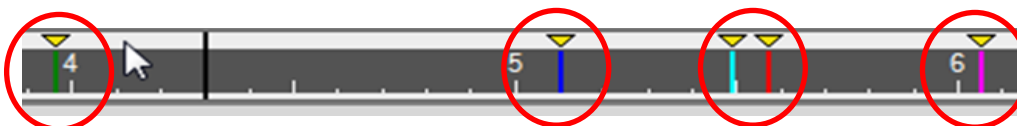
Click on the slider control to change the replay speed.

Speed can be set to:

10% / 25% / 50% / 100%

of the original recorded speed.

5 Marker events for the swing key positions are available:



Swing start* (green)

**Top of
backswing*
(blue)**

**Delivery*
(cyan)**

**Impact*
(red)**

Follow Trough* (violet)

The marker positions can be moved by gripping on the yellow arrows on top of each marker.

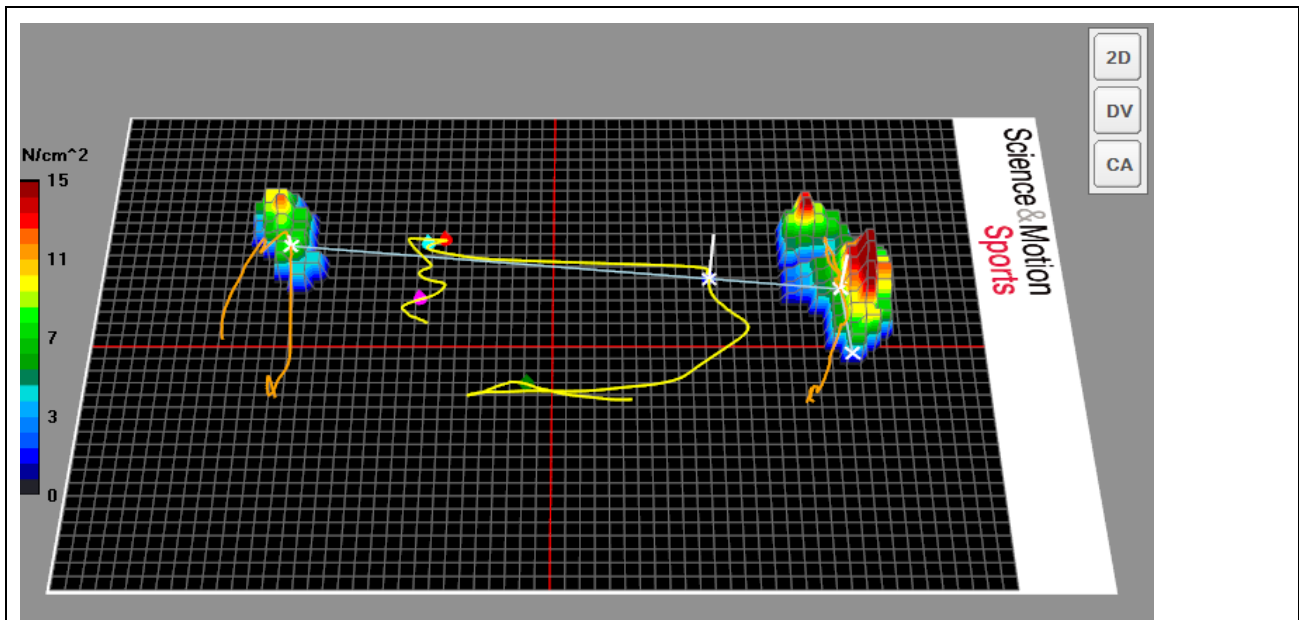
Pressing the TAB key will move the position to the next marker.

The marker positions are important to compare different swings and also for the data display in the report.

*Swing start	Moment when the player starts to move the club for backswing
*Top of backswing	Moment before the clubhead is starting the downswing movement
*Delivery	Moment where the shaft is horizontal to the ground in downswing
*Impact	Moment where the ball is hit (will be set when the trigger signal is received)
*Follow Trough	Moment where the right arm is horizontal to the ground after impact

9.2.3 Description of the data views

a) Pressure data view



In the pressure data view the actual pressure distribution is displayed in 2D or 3D.



In 3D view higher pressure will generate higher "mountains". Also the color changes depending on the pressure applied to the sensors of the plate.

Description of the elements:

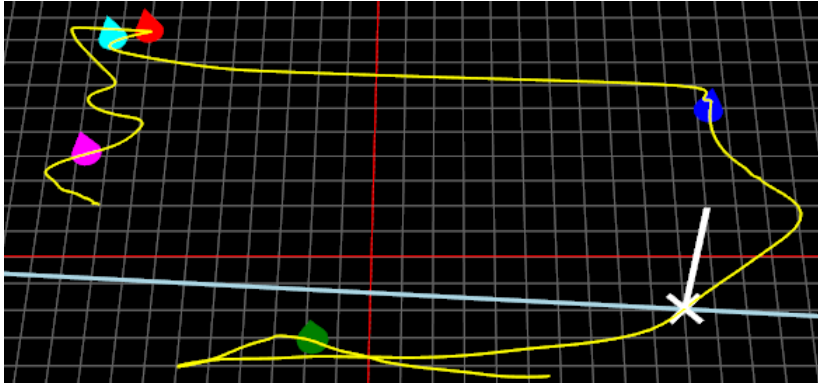
Color bar on the left Shows that low pressure starts with blue color and higher pressure values are indicated by green, yellow or red color

White line on the surface Shows the COP position of the body throughout the swing

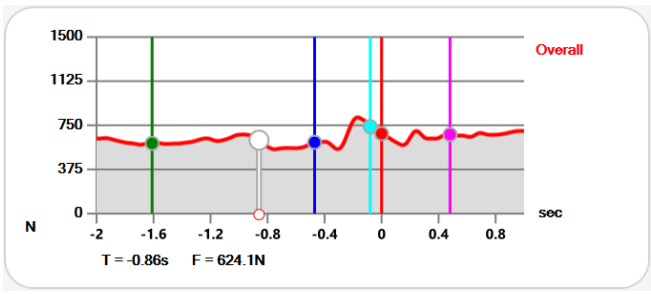



For the current sample the body moves to the right in the backswing, but then a lot to the front in the forward swing. So the weight shift is not applied in direction of the ball – which takes away a part of the potential power when hitting the ball.

Browse and replay data

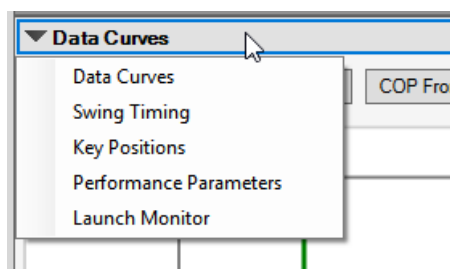
Colored dots on COP curve	Mark the swing events – the colors are the same as in the navigation bar (Swing start / green, Top of backswing / blue, Delivery / cyan, Impact / red, End of swing / violet)
White cross on COP curve	Marks the current data position 
Zoom in / out	To zoom in and out the plate in the view use the mouse scroll or the plus/minus buttons on the keyboard. To change the view angle click and move the mouse inside the pressure view.
2D / 3D view	To switch between 2D and 3D view click on the topmost button in upper right corner of the pressure view window.

b) Pressure curves view, additional data views

	<p>By default this view shows the total pressure curve of the body. Following information is provided here:</p> <ul style="list-style-type: none">• Vertical lines mark the swing events.• Black line shows the current position in the replay.
	<p>Typical for a golf swing is the increase in the downswing coming from Top to Impact. The amount of downforce is an indication how good the player can transfer weight into direction of the ball.</p>

Browse and replay data

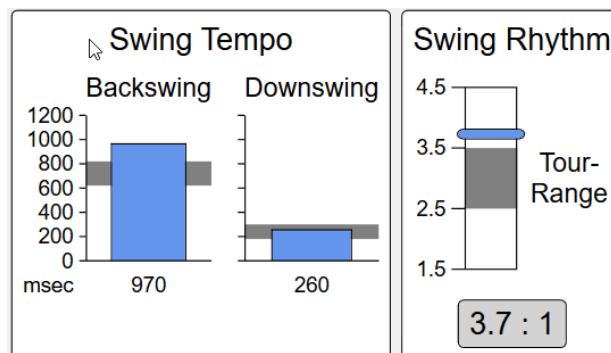
Depending on your software edition there are additional data curves and data views available in this window. Click on the top line of the view to open the selection menu to see all available options.



Swing Timing

The left graph shows the "Swing Tempo", that is the duration for Backswing and Downswing. The grey areas in the graphs show the reference ranges.

The right graph shows the "Swing Rhythm", this is the ratio between Backswing and Downswing duration.

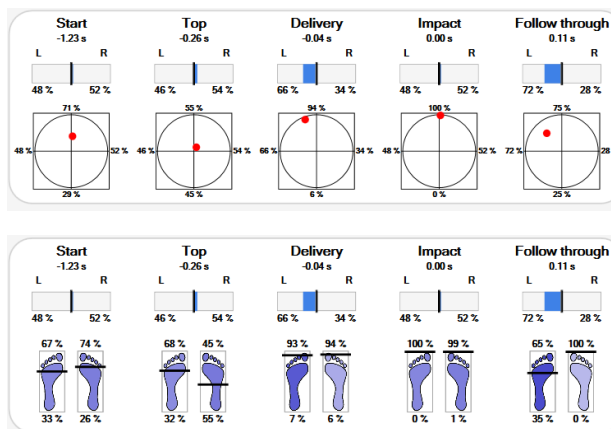


To show correct data for swing timing the event markers for *Start*, *Top of Backswing* and *Impact* must be set.

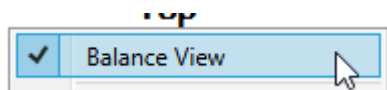
Key Positions

These graphs show the balance and pressure distribution for all key positions (markers must be set!).

If the "Balance View" option is checked the graphics show the balance points for the body, if the option is not checked the balance for left and right foot will be displayed (this is the default setting).



To switch between the two graphics click right mouse on the window and check or uncheck "Balance View":



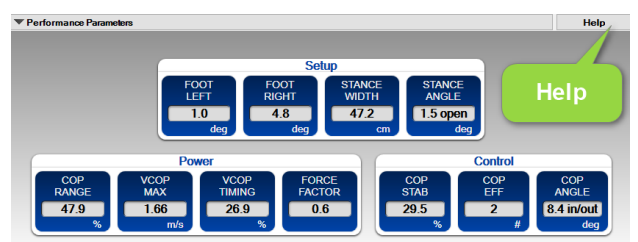
Browse and replay data

Performance Parameters

This data view is only available for the ULTIMATE edition of the software.

It shows extracted key parameters for the swing which help tracking or comparing the performance of a player.

Please refer to the online help for details on this feature, help button is positioned in the top right corner of the window.



Launch Monitor



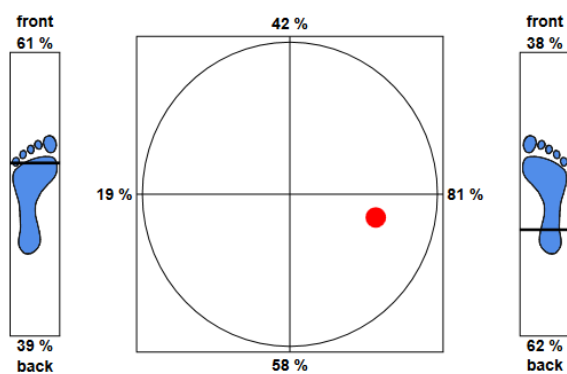
Only available if the "Launch Monitor" plugin is installed.

Integration for Trackman, Flightscope and Foresight GC2 is available.



If launch data is recorded it can be viewed in the replay for each swing. All data provided by the systems will be saved during recording and then displayed when the swing is opened in the Replay.

c) Balance view



The balance view shows the balance of the player.

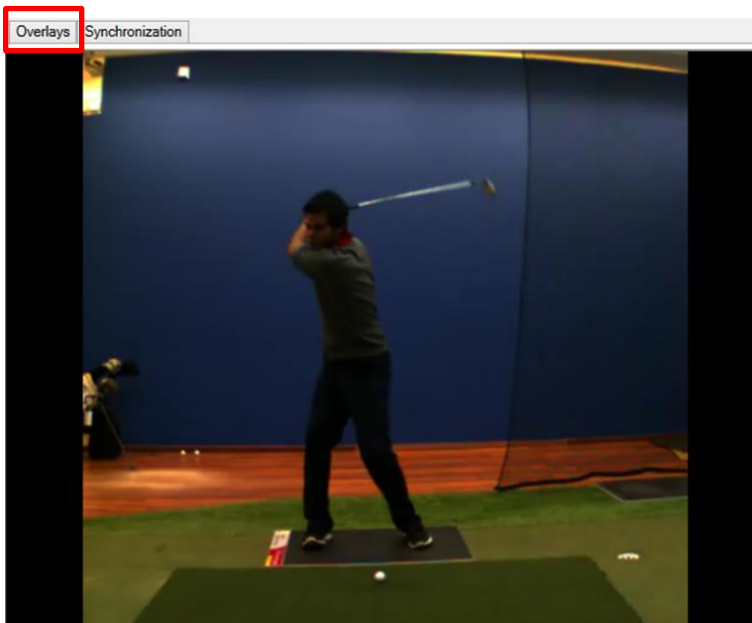
Following information is provided here:

- current COP position for the body (position of the red dot in the circle)
- total percentage values of weight on front / back / left / right
- the heel/toe balance for both feet separated (black lines and percentage values)



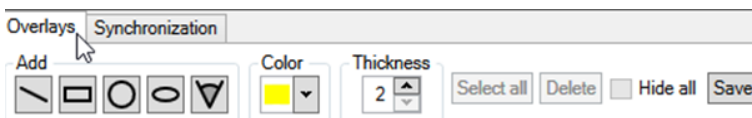
The balance view is great to check weight distribution of a player against reference values given for certain positions (see report section of this document for more details).

d) Video view



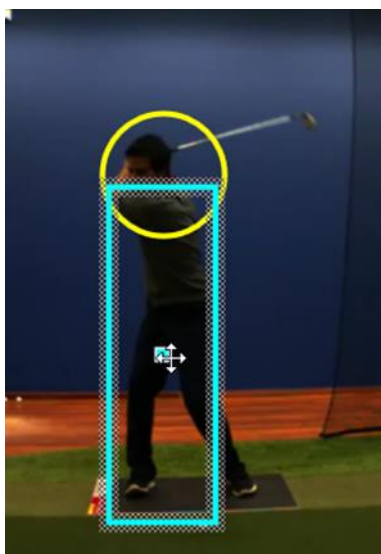
Beside the standard display of the video this view offers some overlay drawing functions.

- Click on the "Overlays" button to open the options pane.



- A click on a button with the drawing symbols will add a drawing object to the video.

Browse and replay data

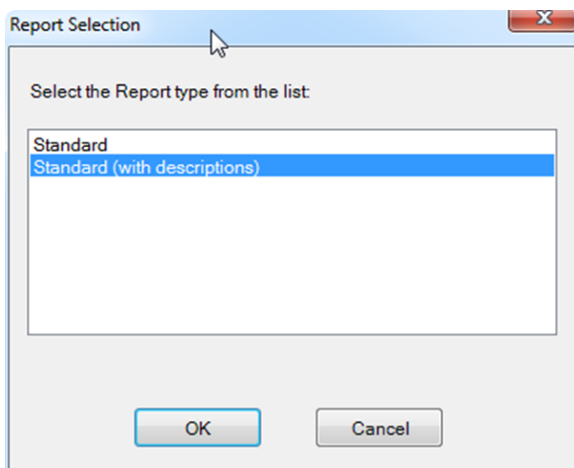


- The active object is marked.
- To move the object place mouse over the center area and click on the square that shows up. Then hold mouse key pressed and move.
- To resize an object place mouse cursor over the one edge and you will see small circles. Move mouse over one circle and until the double arrow shows up and then click mouse and move to resize.
- Line color and thickness also can be changed.
- If you press the "Save" button the current overlays will be saved to this record permanently.

10. Open a result report

A report can be opened from the main screen for the current selected record or from the replay view.

Both screens contain the "Report" button.



1. Press the "Report" button.

☞ A selection window will pop up with a selection of available reports.

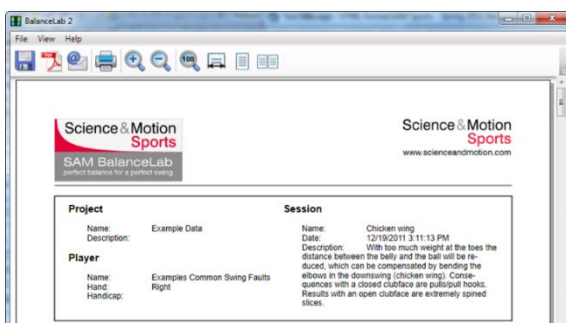


The "Standard" report shows only the results for the current record, the "Standard (with descriptions)" contains one description for every data page.

2. Click on Standard (with descriptions)".
3. Click "OK" to open the report.

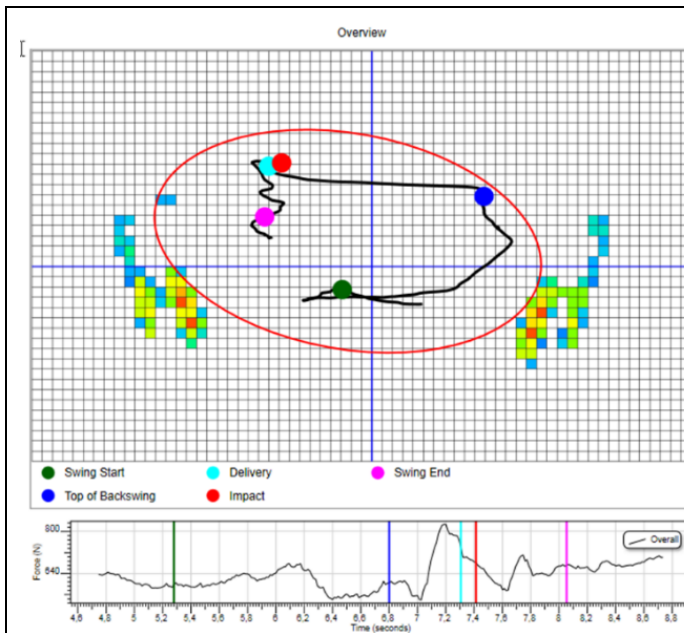
☞ After some seconds the report window will open:

The report is a multi-page document and contains the following informations:



- Logo area on top of each page, the left logo can be easily exchanged by a custom logo.
- Following on page 1 a data information section with information about Player and recording.

Open a result report

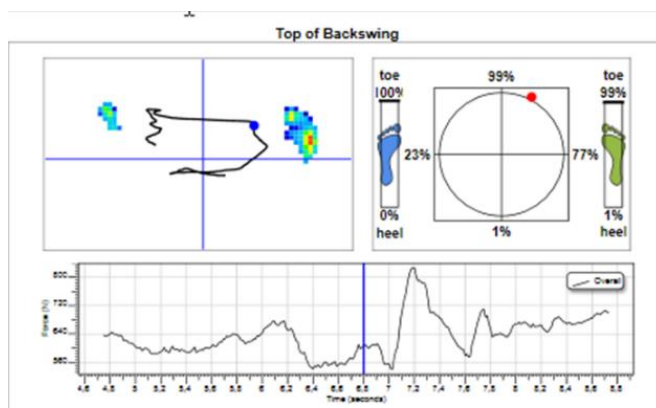


Following on page 1 a pressure view overview and the pressure data curve.

- All the swing phases (events) are displayed in the graphics as dots or lines.
- The red ellipse indicates the direction and flatness of the pressure distribution during the swing.



Ideally the ellipse should be quite flat (that means not much weight shift to front or back). And the direction should be straight into ball direction. In this example the ellipse is much too high and also tilted to the outside.



Following the front page there will be one additional page per swing event (see example on the left for the "Top of backswing" event).

For each of the events the current data will be displayed for:

- Pressure distribution
- Player balance
- Over all pressure curve and current position
- Picture from the video for this position

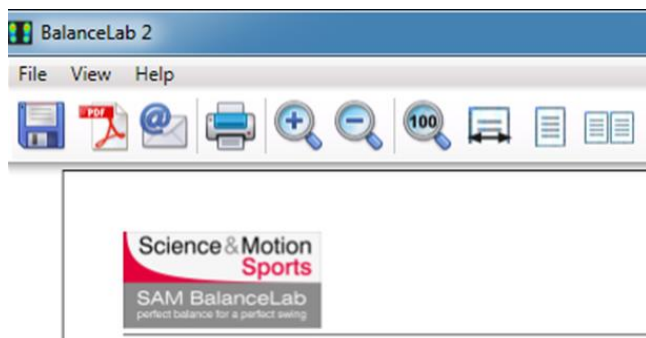
If the report with descriptions has been selected each page will be followed by a page with descriptions for this swing event.



Open a result report



Please try this and compare the actual player data with the reference data given on the description page.

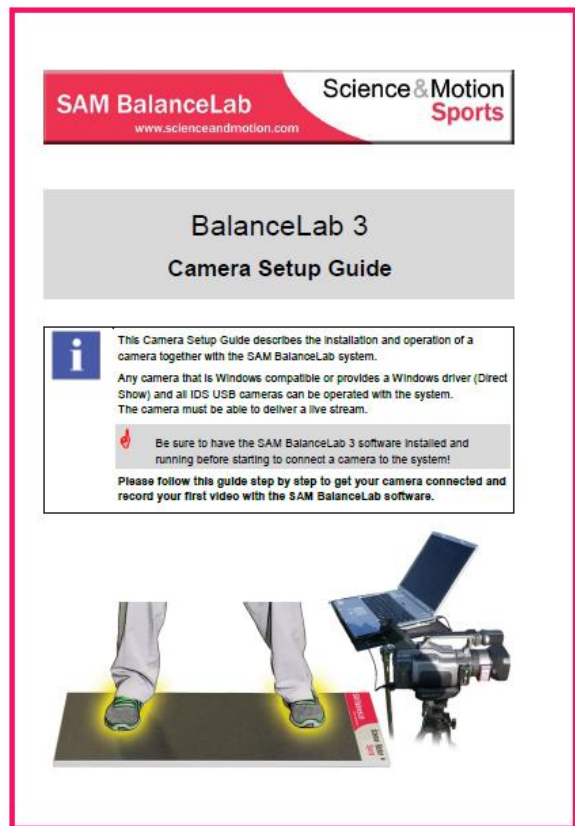


The toolbar on the top of the report window offers the following options:

- Saving the report as a PDF or XPS document
- Send the report as email with attached PDF
- Print the report
- Zoom options for zoom up/down, full page view, double page view

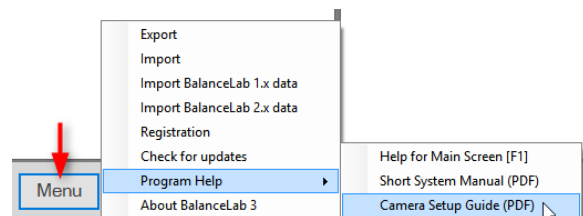
11. Camera installation

Please refer to the provided document "Camera Setup Guide" for camera installation and configuration instructions.



This document is also available in the software main help section as a PDF.

Please click on the menu in the main screen of the software and select "Program Help" and then open "Camera Setup Guide".

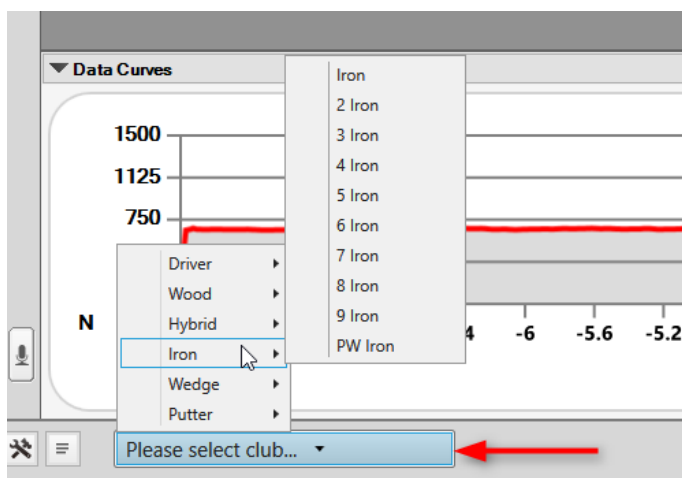


12. Tipps & tricks

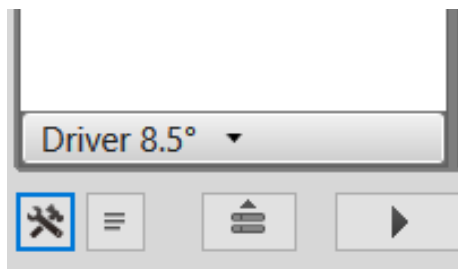
12.1 Club type selection

Usage of different clubs like Irons or Drivers or Wedges will lead to slightly different results for balance or COP trace in BalanceLab.

For this reason it makes sense to select the club type in all recordings. In later replay of the data the club type will be displayed and it is always clear which club was used in the recording.



In the recording window the club can be selected at the left of the bottom bar.



In the Replay windows the club information is displayed at the bottom of the data selection bar.



By clicking on this button you can always edit the club information at a later time (e.g. if you forgot to do this during the recording).

13. Further Safety Warnings

13.1 General Handling Precautions

- I** Do not take apart/modify the equipment/system in any manner other than described in the manual.
If the cover is removed it is possible that you could be exposed to lethal voltages or other hazards.
- I** Never use the device in a damp place or where it could possibly be sprayed with fluids.
Any fluid penetrating the device can cause a fire, electric shock or other serious accidents.
- I** Never pour any fluid over the system or its components.
- I** Do not place the system on an unstable surface.
- I** Do not install the system above or near any heating.
- I** Only operate the system using the stipulated mains voltage and the supply unit that has been approved for medical products and is included in the delivery by the manufacturer.
- I** Lay the mains cable such that no-one can trip over it and check regularly it isn't damaged.
- I** Never insert any objects in the system components.
- I** Should one of the situations in the following list occur, please contact the manufacturer:
 - The mains cable or mains plug has been damaged.
 - Fluid has been spilled over the main device or other system components.
 - The system fails to function properly although the operating instructions have been adhered to.
 - The platform or other system components has/have been dropped or the housing has been damaged.
- I** When cleaning the equipment, use a well-wrung, water-moistened cloth. Do not use flammable liquids, such as alcohol, benzene or thinners.
If a flammable liquid enters the inner electrical parts, fire or electrical shock may result.
- I** Most of the package components are shipped inside plastic bags.
These bags can be dangerous.
To avoid danger of suffocation, keep the plastic bags away from babies and children.

13.2 Safety Instructions for applying the Platform

- I** The players' data and measuring data may only be copied, moved, or deleted using the database function provided by the SAM application programs. In the case of data being changed intentionally without using database functions, the user alone bears the full risk.
- I** An injury hazard exists for the player from the cables. Please observe here the special instructions in the application software manuals and take particular care not to allow any children or mentally retarded persons to go near the device without supervision.
- I** Should there be any damage to the device or component parts, they should be returned to the manufacturer for a safety check. It is forbidden to continue using them, as severe damage and serious injuries - even lethal injuries - may result. The manufacturer must always be contacted in all cases of fault or doubt.
- I** We also point out that by making changes to this certified device or its accessories your legal right to operate it will be nullified.
- I** The platform must be set up on a non-slip base, or built into a catwalk, in order to rule out any danger to the player due to the platform slipping.
- I** The servicing, repair and re-adjustment must only be carried out by authorized, qualified specialist. Only store and transport in the original packing supplied by the manufacturer.
- I** Do not place the equipment near flammable liquids such as alcohol or thinners.
If these come in contact with internal electrical parts fire or electrical shock may result.
- I** Do not place the following objects on top of the equipment: 1. Metallic objects, such as necklaces. 2. Containers with liquid, such as cups, vases, and flower pots.
If the internal electrical parts come in contact with these, fire or electrical shock may result.
If any of these objects or liquids enter the equipment, immediately unplug the USB cable and contact your retailer.
- I** Do not place the equipment in the following areas: 1. Areas with high temperatures (higher than 60°). 2. Areas near flame sources.
Fire or electrical shock may result