SAM PuttStudio 8.1

Balltracker Reports Manual

Reference

SAM PuttStudio 8.1 Balltracker Reports Manual [02/2026]

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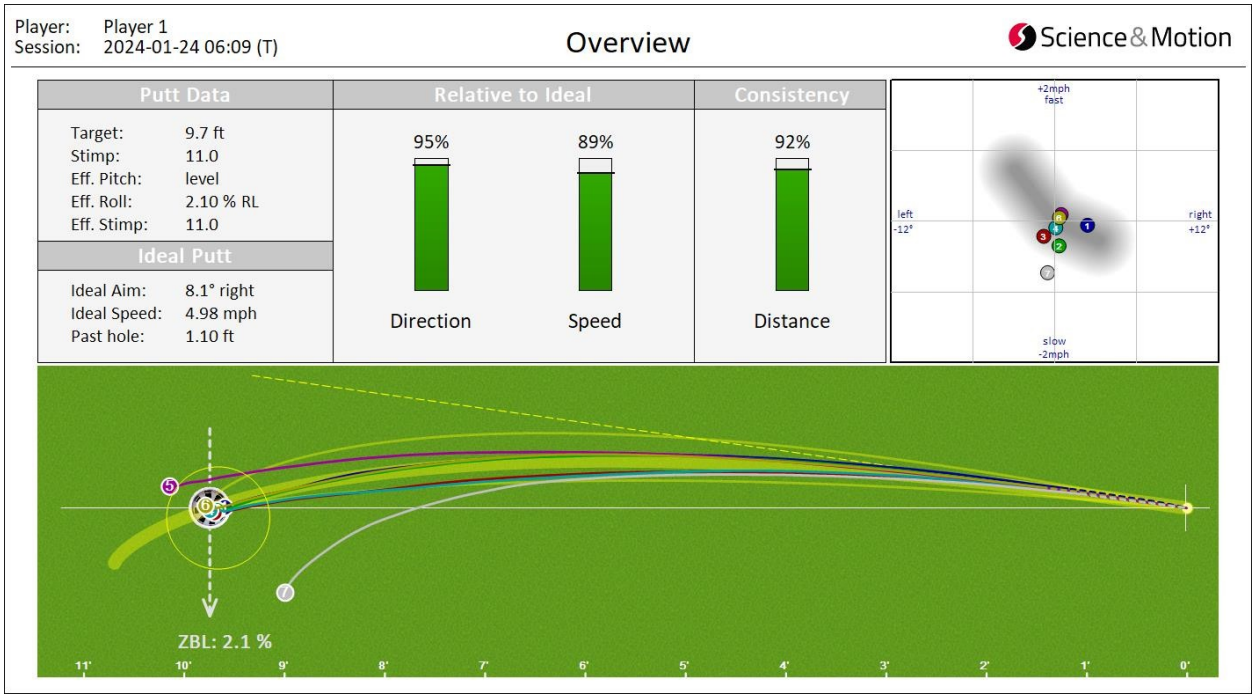
CONTENT

1. SAM PuttStudio Reports overview

1.1 What is a "Report"

SAM PuttStudio Reports display the balltracker data and optional the putting data (for SAM PuttStudio PLUS) using images, graphics, numerical data, data bars, or Scoring bars. The Reports consist of an arrangement of different “Tiles”. A Tile is a defined data view in which the results are presented in easy-to-read graphics and numbers. The size of the tiles is full-screen (XL-Tile), half-screen (L Tile), quarter-screen (M-Tile) and one eights screen (S-Tile) (see also chapter 1.3). However the Balltracker Reports are only available in the XL tile format.

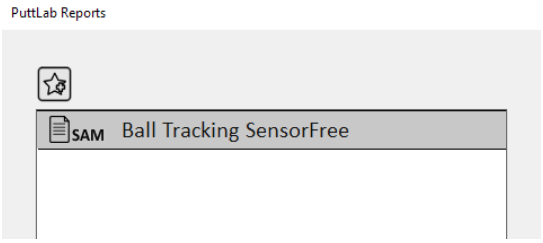


The set of Balltracker Reports delivered with SAM PuttStudio contains 6 ***Report Pages***, and on each *Report Page* a Report Tile is displayed.

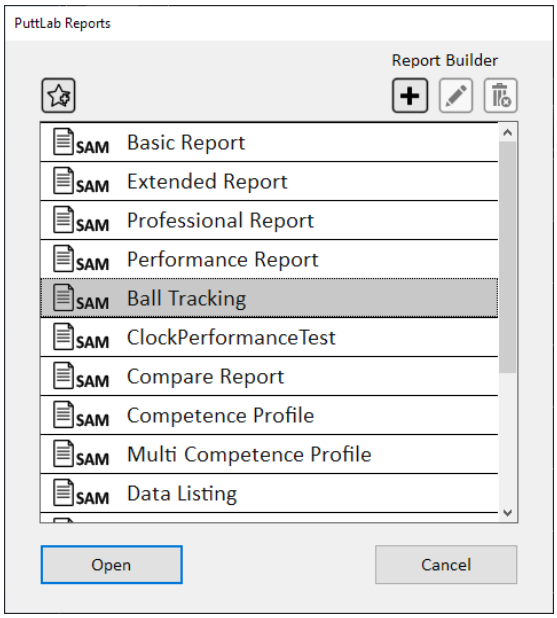
A Report can be selected by clicking on the “Reports” button on the main screen:

1.2 Selecting a Report

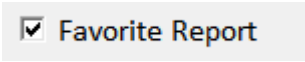
For SAM PuttStudio, where only ball-tracker data is available, only the Balltracking report can be selected for the reports list:



For SAM PuttStudio PLUS, where also putter data is recorded with SAM PuttLab, the Balltracking report needs to be selected from the general reports list.



Reports can be set as "Favorites" by checking the "Favorite Report" checkbox:



Favorite Reports are listed on top of the list. The list is sorted alphabetically.

Data sets containing Balltracking data are indicated by the letters “BT” at the right side. Data Sets which contain **only** Balltracking data are indicated with the icon “**SF**” in the session list:

To open the default Report for a session, you can simply double-click on the corresponding session entry in the list, and the report will open up directly.

1.3 Report Tiles and Report Builder

Report Tiles

Report Pages can be composed with Report Tiles of different sizes. However the Balltracker Reports are only available in the XL tile format:

X Large (XL)	One XL-Tile fits on one page. The extra-large XL-Tiles are the most detailed representation of a result parameter. XL-Tiles are comparable with the old Screen report pages of previous PuttLab versions.	

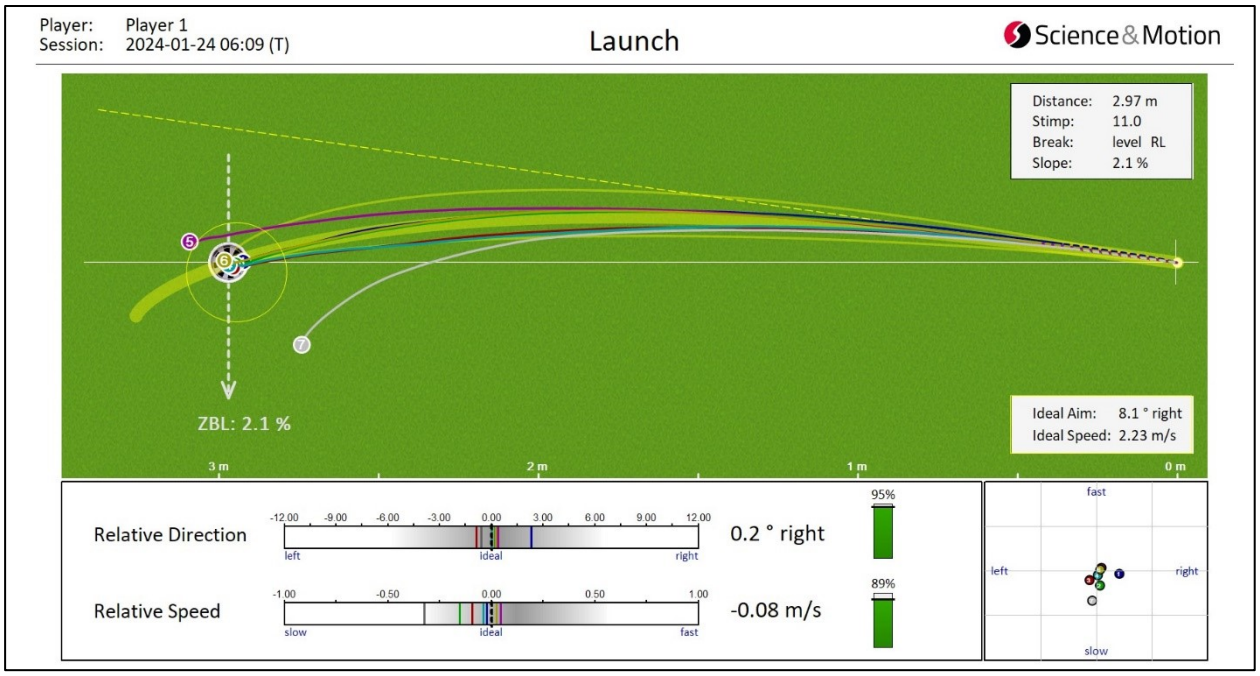
Report Builder

With the Report Builder it is possible to create customized Reports or to edit existing ones. However the Balltracking Report is a fixed set of Report pages which cannot be modified in the Report Builder.

For SAM PuttLab reports in SAM PuttStudio PLUS the Report Builder allows to add or edit pages and to choose from a selection of more than 80 existing tiles for all relevant putting parameters. The Tiles are available in different sizes. For more details on the Report builder see the SAM PuttLab Reports manual.

To learn how to create your own Report page, you can also watch our Tutorial Video on YouTube: https://youtu.be/Zs9B-wX6vX4

1.4 Report Screen



SAM **PuttStudio** Balltracking Reports show the results for the currently selected dataset in a multi-page document with different graphical elements, data bars, numbers, or Scoring bars. The reports are described more in detail in Chapter 2.

You can scroll through the different report pages via the toolbar at the right side or by using the page up / page down keys.

1.4.1 Toolbar

The following functions can be executed via the upper toolbar:

- Open or print the report as PDF document

- Save the report page as a JPG picture file

- Copy the report page to the clipboard

- Send the report as PDF via your email account

- Switch between all putts display mode and single putt display mode, where the corresponding scroll buttons are activated.

- Delete single Putts (only in single putt display mode)

- Display the putts in the 3D Module (or the 3D Putt add-on software)

- Play corresponding videos (if available)

- Simulate the path data for holed putts, or for putts after collision.
A specific mathematic algorithm calculates the virtual ball path until the predicted end position. The simulated path will be displayed with a dotted curve. All ball data will be updated accordingly. Does make sense e.g. if inspecting the shot pattern or if calculating distance consistency.

- Close the report

1.4.2 Function keys

Function keys are available for direct access to important Report functions:

[F1] – Help on Reports

[F2] - Open or print the report as PDF document

[F3] - Save the report page as a JPG picture file

[F4] -

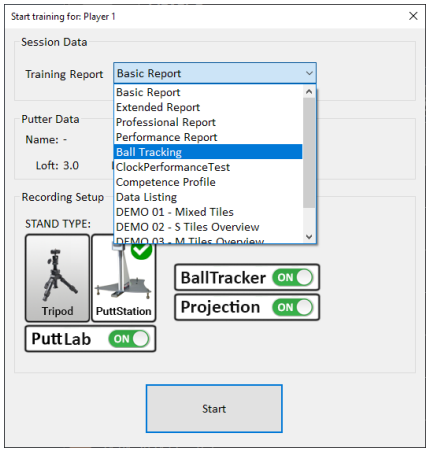
[F5] – Switch the Score bars on and off

[F6] – Switch the Consistency bars on and off

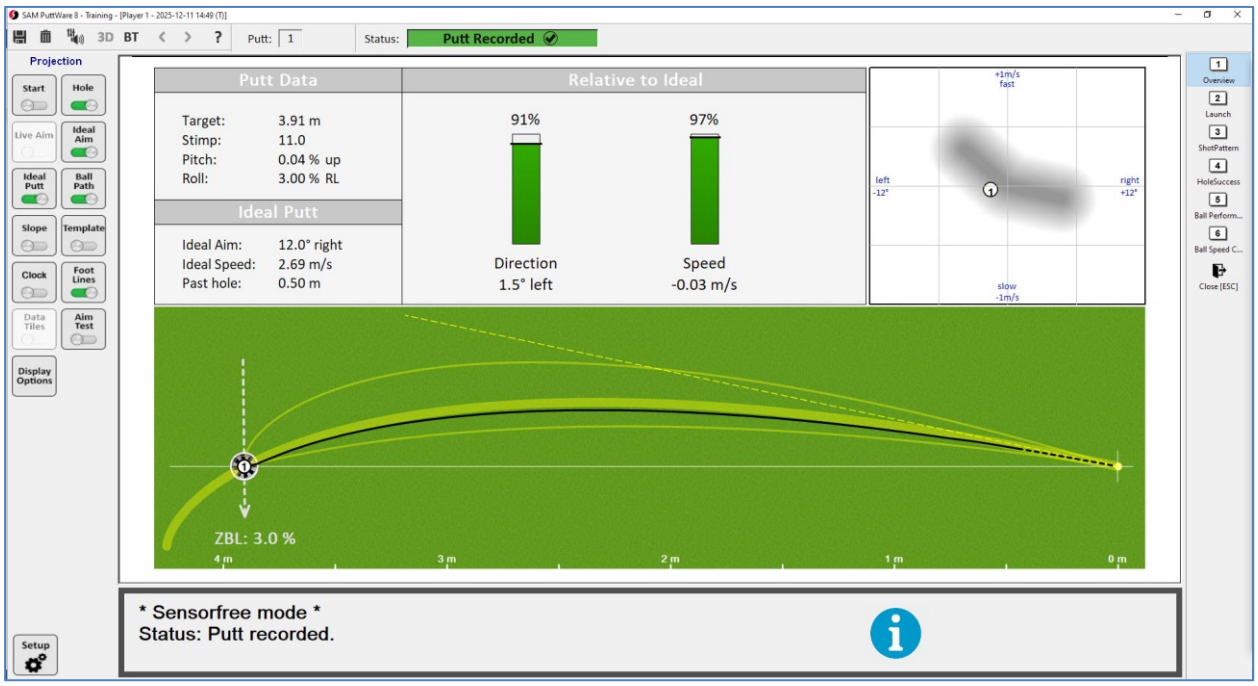
[F7] – Switch the numerical single data display on and off

1.5 Training Reports

The Balltracker Report can also be used for Training sessions. If starting a Training the Balltracker report needs to be selected from the dropdown list for the PuttStudio PLUS. For the PuttStudio (without PuttLab) only the Balltracker report can be selected.



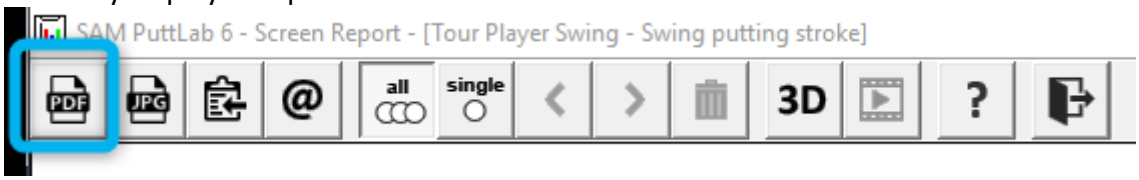
The Training Report Screen is quite similar to the Report Screen, but the training report shows data for each single putt. There is no Consistency rating in the training report, as only one stroke is displayed at a time. The actual number of recorded putts is shown in the upper Toolbar. The report display is slightly reduced in size so that in the lower part live data or status messages can be displayed.



The toolbar on the left side allows to set (right mouse click) and select (left mouse click) the projection settings for the different Projection objects. For more details on the projection objects please refer to the SAM PuttStudio operations manual.

1.6 PDF Reports - Printing

All Reports can be viewed and saved as a PDF.
Press the PDF button in the toolbar at the top of the report screen to create a PDF from the currently displayed report:



The PDF document will then be opened with the standard PDF viewer of your computer.

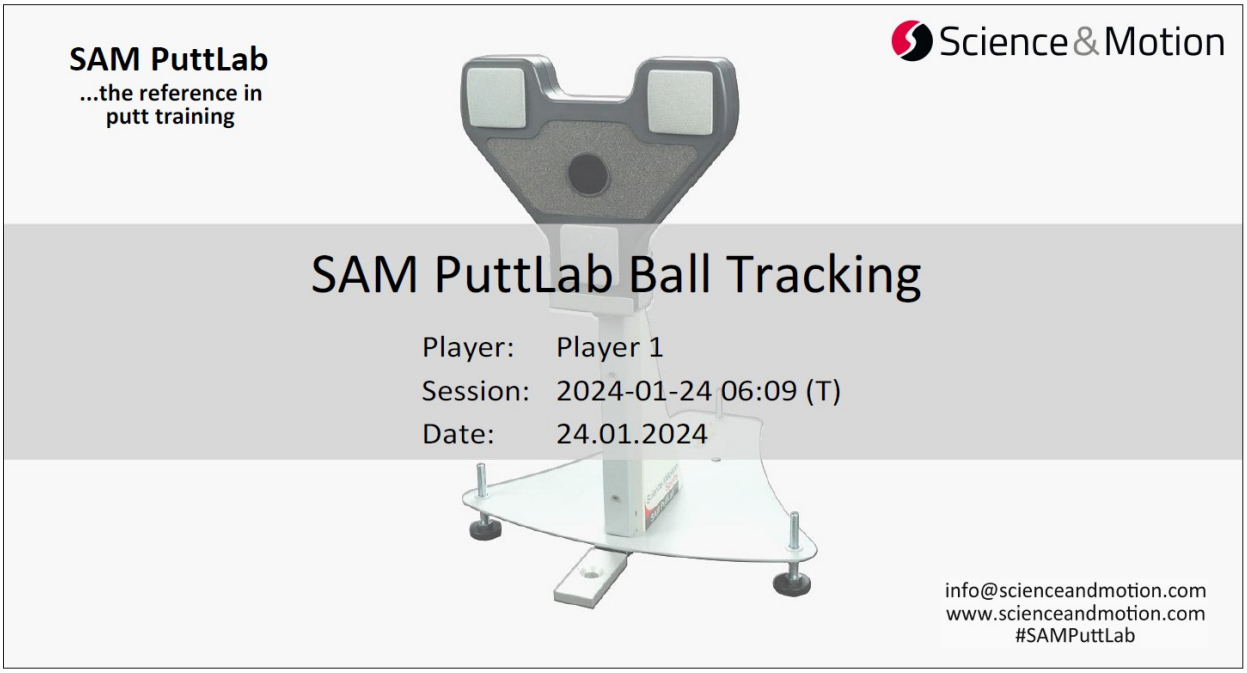
If you do not have a PDF viewer installed, please download and install the Adobe Reader.

In the PDF viewer software you can use the print options to create printouts, or you can save the report as a PDF file to your local disc or cloud drives.

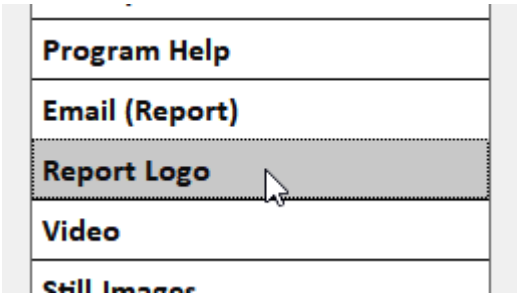
A cover page is added to the reports with some basic information on the dataset such as the player's name, the session name and the measurement date.

Adding a custom logo

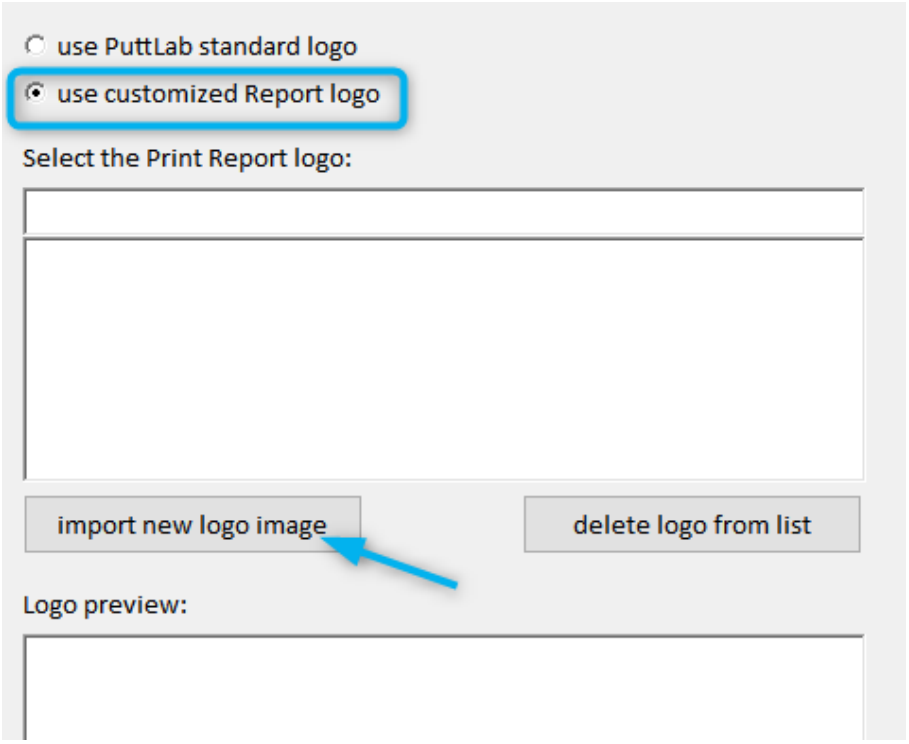
To promote your location or business you can add a custom logo to the cover page
The standard cover page looks like this:



The area for the custom logo is the upper left corner, marked here with the blue box.
To add a custom logo open the program settings in the main screen and select the option "Report Logo".

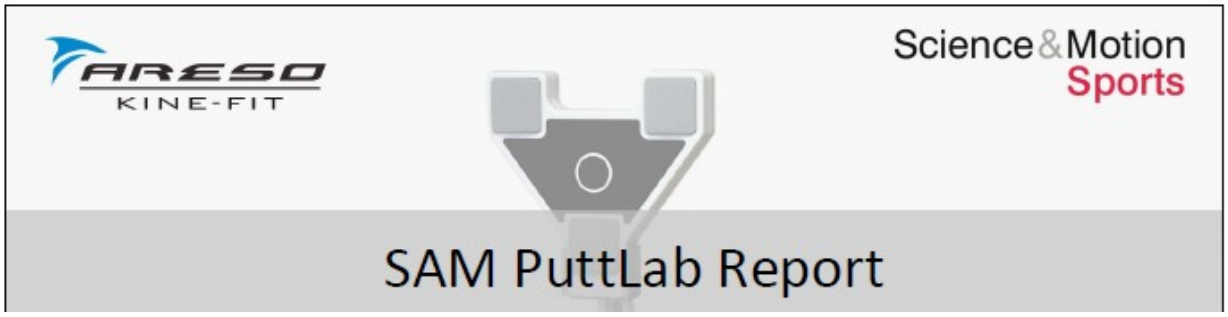


In the settings window click on the option "use customized Report logo" and then press the button "Import new logo image":

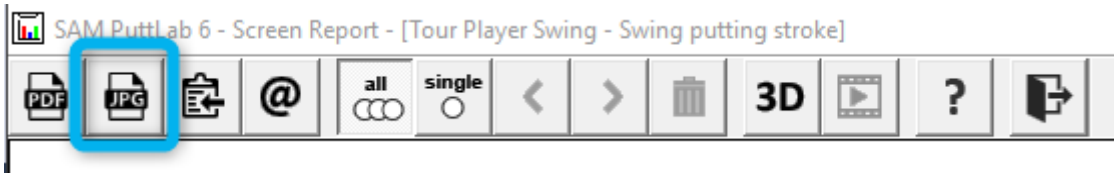


Your custom logo should have a landscape format and a width/height ration of about 1.6 to fill the allocated space in an ideal way. After importing the logo file it should be available in the file list and you should be able to see it in the logo preview. Save the selection by pressing OK in the settings window

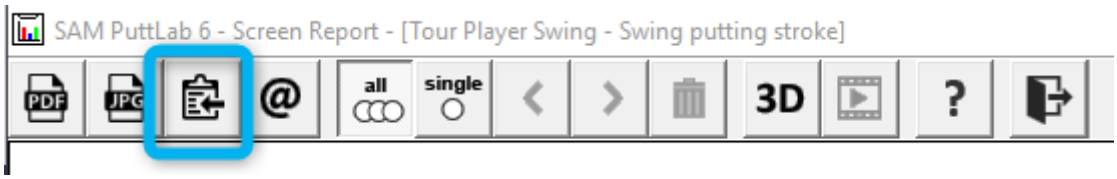
To check if the new logo is displayed in the right way open a Report and press the PDF button. The cover page should then show the logo in an adequate format and size:



There are two other options to export Report pages to graphics or to the clipboard:



This button will save the actual report page as a JPG picture file.

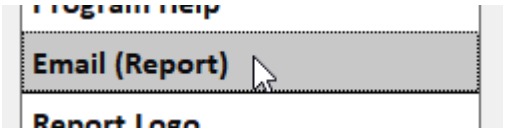


This button will copy the actual report page to the clipboard. You can paste it to any other software like Word or directly into an email.

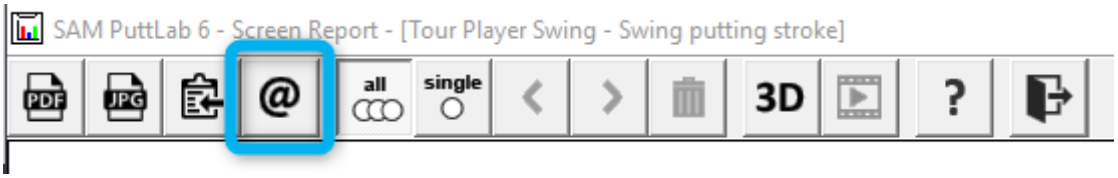
1.7 Emailing Reports

Complete PDF Reports can directly be emailed using either the installed email client program or using the Email engine built in into the PuttLab software.

Before this option will be functional the Email settings have to be set in the general PuttLab settings. Open the program settings in the main screen and select "Email (Report)":



After the settings are finished you can send emails by pressing the email button in the top bar of the Report screen:



If the actual player's email is already available in the Player data this email will be used. If not, you will see a prompt where you can enter any email address. Then just press the "Send" button.

2. BallTracker Report pages

2.1 Page 1: Overview

Balltracker Reports are only available as XL - Tiles, meaning that only **one** report page can be displayed on **one** Report screen.

Report header:

- **Player** – The name of the player and the corresponding biometric data.
- **Session** – The name of the session, the description and the date of the session. A session contains one or more data sets which belong together (i.e. in a putter selection process).

Putt Data:

- **Target** – Distance of the putt, from the start position to the target.
- **Stimp** – Defined Stimp speed of the putting turf.
- **Eff. Pitch** – Effective pitch (up/down angle) for the selected putt. If the putt is across the green, the relevant pitch is calculated from the given roll and pitch of the surface.
- **Eff. Roll** –Effective roll angle (left/right) for the selected putt. If the putt is across the green, the relevant roll is calculated from the given roll and pitch of the surface.
- **Eff. Stimp** –Effective Stimp speed of the putt. If the putt is uphill or downhill (eff. Pitch not zero), then the effective Stimp speed on the true putt line will change accordingly.

Ideal Putt:

The ideal putt is defined by either ball distance past hole or entry speed into the hole. The ideal definition mode and the conditions can be selected in the Setting Dialog for "SAM Studio Settings", or temporarily changed in the "Ideal Putt settings" dialog accessed through the display object in the left toolbar on the report screen (use right mouse-click). Recommended values for distance past hole are 1 ft = 30 cm or entry speed of 0.5 m/s.

- **Ideal Aim** – The ideal aim angle corresponding to the ideal putt.
- **Ideal Speed** - The ideal speed corresponding to the ideal putt.
- **Past hole** – The resulting distance past hole of the ideal putt.

Scoring bars:

In the middle section of the report, three scoring bars display relative Direction, Speed, and Distance Consistency. The Direction and Speed scores refer directly to the defined ideal putt values and do not account for potential direction or speed compensations. As a result, a putt may still be holed if break and speed align at a different level. Lower score values indicate greater deviation from the ideal putt conditions.

- **Direction** – Calculated Score of the start direction of the putts played relative to the ideal putt direction.
- **Speed**– Calculated Score of the launch speed of the putts played relative to the ideal putt speed.
- **Distance** – Calculated Score for the Consistency of distance (end positions) of the putts (not available for one putt only).

Break Match Graph:

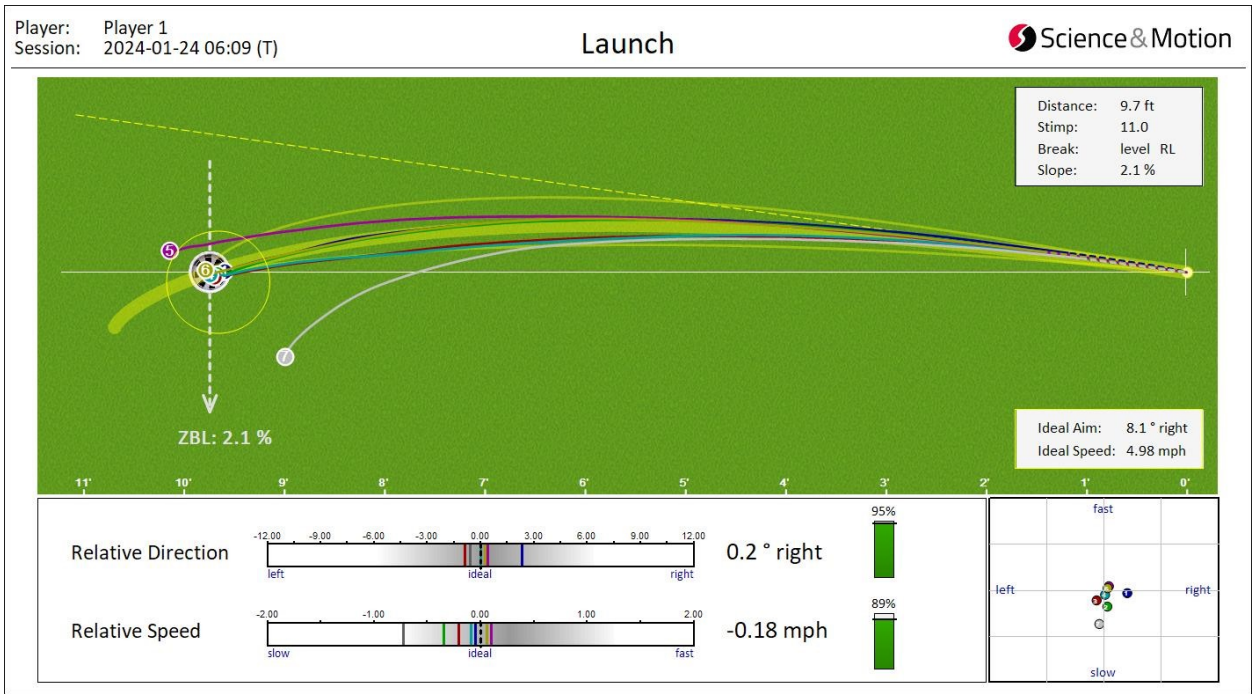
On the right side of the report, a Break Match Graph shows how closely each putt matches the ideal putt, represented by the center of the graph. It also illustrates putt tendencies—such as speed (slow or fast) and direction (left or right)—and how potential break and speed compensations contribute to a possible solution. The gray area of the graph represents the zone in which putts have the potential to be holed.

Tracked ball paths:

In the lower graph the tracked ball paths are displayed, overlayed to the ideal putt (thick line) and the ideal corridor (thin lines). The dotted line represents the ideal aim line. The yellow circle represents the distribution of the putts (shot pattern), the smaller the circle the more the putts are lying closely together.

The ZBL (Zero Break Line) line represents the direction of the slope with a corresponding slope number down the ZBL.

2.2 Page 2: Launch



This report page is more specifically dedicated to launch conditions of the putts. It can perfectly be used in the training mode where you receive more detailed feedback for each putt.

The upper graph is pretty similar to the graph on the first page. In the lower section detailed launch information on the putts is displayed.

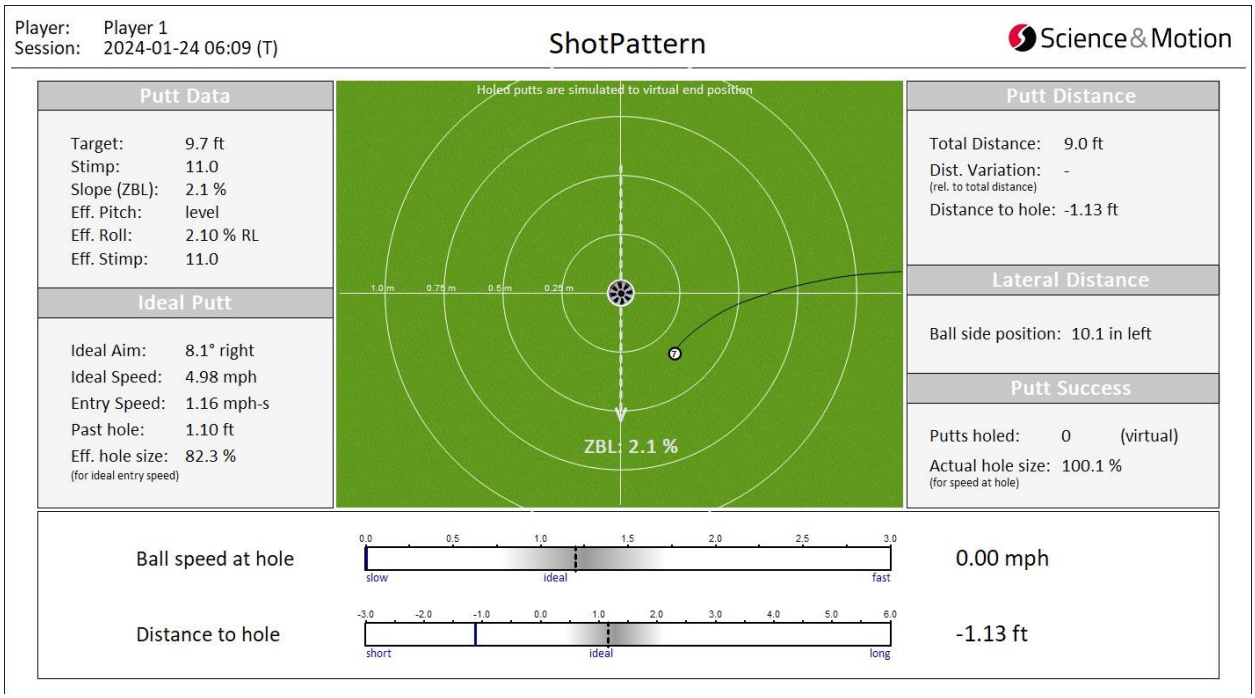
Relative direction
Single data values on a data bar for the relative start direction of the putts played (relative to the ideal putt direction). On the right side the average relative direction and a corresponding performance Score is displayed.

Relative Speed
Single data values on a data bar for the relative start speed of the putts played (relative to the ideal putt speed). On the right side the average relative start speed and a corresponding performance Score is displayed.

As relative Direction and Speed Scores refer directly to the defined ideal putt values and do not account for potential direction or speed compensations, a putt may still be holed if break and speed align at a different level. Lower Score values indicate greater deviation from the ideal.

Break Match Graph
On the lower right side of the report, a Break Match Graph shows how closely each putt matches the ideal putt, represented by the center of the graph. For more details on the Break Graph please refer to chap. 2.1.

2.3 Page 3: Shot Pattern



This graph is dedicated to analyze the end position of the putts, and shows the resulting shot pattern, in this case for the 7 putts played. If the “BT Sim” simulation mode (see chap 1.4.1) is switched on, the 5 holed putts are simulated and displayed until their predicted end position.

Ideal Putt data:

Details on the calculation of the ideal putt are already mentioned in chap. 2.1. In this report extended information on the ideal putt is displayed:

- **Ideal Aim** – The ideal aim angle corresponding to the ideal putt.
- **Ideal Speed** - The ideal speed corresponding to the ideal putt.
- **Entry Speed** – The resulting entry speed for the selected ideal putt conditions
- **Past hole** – The resulting distance past hole for the selected ideal putt conditions
- **Eff. Hole size** – The resulting effective hole size for the selected ideal putt conditions

Putt Distance:

Information on the distance of the putts:

- **Total Distance** – The total distance of the putts (end positions) **in the direction of the hole**. The path sideways to the hole is **not** considered. If the ball was holed or in case of a collision, the “BTSim” Option on the toolbar can be activated to switch to a simulated end position for more realistic results (see also chap 1.4.1)

- **Distance variation** – The average distance variation of the Total Distance of the putts relative to average distance of the putts, in %. A value of 5% at an average distance of 12 ft means that the putts varied by 12ftx5%=0.6 ft in Total Distance. A value of 5% is considered as a good result. The Consistency bar to the right represents the performance Score for the Distance variation.
- **Distance to hole** – The absolute distance to/past the center of the of the putts.

Lateral Distance:

- **Ball side position** – The average distance to the side of the hole at the end position of the putts played.

Putt Success:

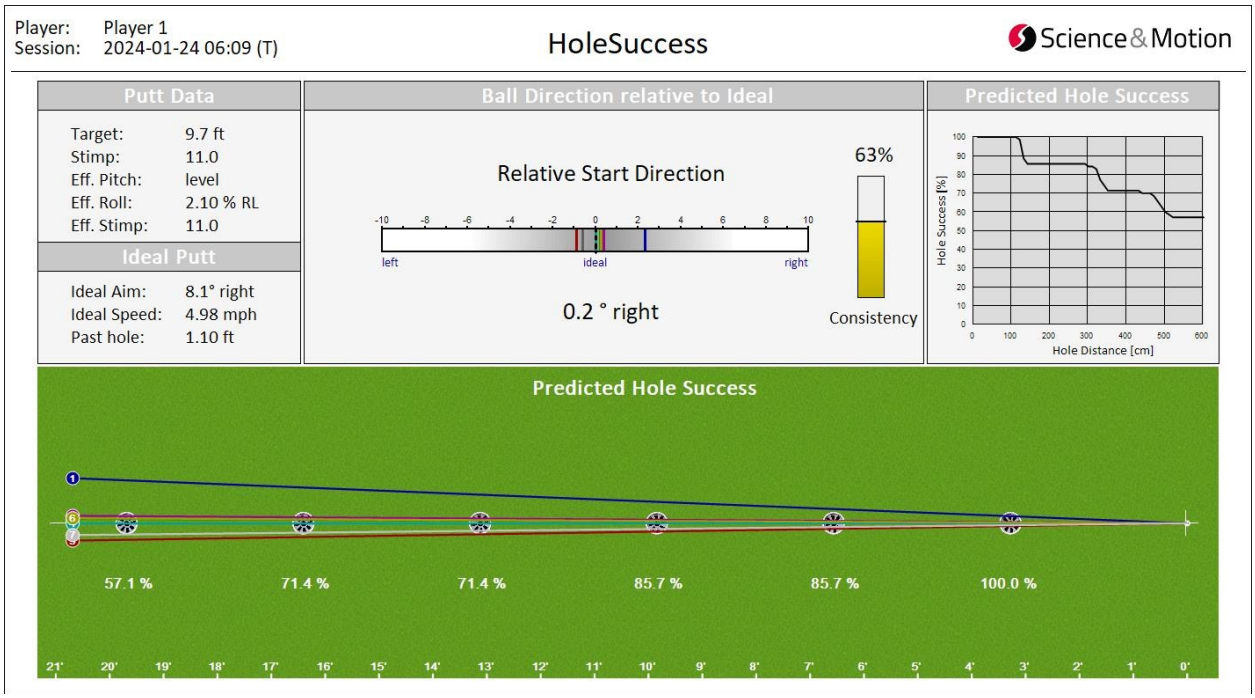
- **Putts holed** – The number of putts holed. If the Target was a virtual hole, or the simulation mode is on, then the hole success will be calculated for the virtual holes, also considering the entry point and entry speed of the putts (so a putt can also lip out).
- **Actual hole size** – The resulting effective hole size relative to the entry speed to the hole.

In the lower section detailed information on the putts relative to the hole are displayed.

Ball speed at hole (Entry speed)
Single data values on a data bar for the speed of the ball reaching the hole. If a putt did not reach the hole, then the hole speed is 0. On the right side the average entry speed of the putts is displayed. The ideal entry speed is defined in the Ideal Putt data section.

Distance to hole
Single data values on a data bar for the distance to/past the center of the hole. If a putt did not reach the hole the distance to hole is negative. If a putt was physically holed, the distance to hole is 0. In this case, if the “BT Sim” is switched on, then the putt path is further simulated until its predicted end position, and a corresponding realistic number for distance past hole is shown. On the right side the average distance to hole is displayed.

2.4 Page 4: Holing Success



This graph predicts the probability of holing putts at different distances based on the ball's start direction relative to the ideal putt direction. On a level green, the ideal start direction is 0 degrees. On a tilted green, the relative start direction is defined with respect to the ideal putt, as described in Chapter 2.1. At defined distances of the putt the probability numbers are shown in %. These numbers also correspond to the Hole distance graph.
This report is primarily applicable to level greens; for tilted greens, it is important to ensure that the golfer genuinely aimed the putts toward the ideal putt line.

Relative Start Direction
Single data values on a data bar for the relative start direction of the putts (relative to the ideal putt). The number underneath shows the average start direction. On the right side a corresponding Consistency Score for the relative start direction is displayed.

Hole Distance Graph
The hole distance graph visualizes the total holing success in % for different distances up to 6 m or 18 ft. In the example shown, 100% of the putts of 1m distance would have been holed, on 2 and three meters about 85.7%, on 4 meters 71.4 % and on 6 meters 57.1 %. These numbers are also shown in the Hole success graph.

2.5 Page 5: Ball Performance

Player: Player 1
Session: 2024-01-24 06:09 (T)

Ball Performance

Science & Motion

Putt	Launch			Skid phase			Ball Roll				
	Rel. direction [°]	Launch speed [mph]	Smash factor	Skid distance [in]	Skid time [ms]	Speed drop [%]	Roll Speed [mph]	Roll Ratio [%]	Distance to hole [ft]	Ball side pos. [in]	Stimp played [ft]
1	2.3 right	4.92	1.74	14.5	186	31.2	3.39	88.5	0.00	5.7 left	10.9
2	0.2 right	4.63	1.64	13.2	183	29.2	3.28	88.8	0.00	1.8 left	10.7
3	0.9 left	4.77	1.65	13.3	175	25.7	3.54	89.8	1.32	7.6 left	10.2
4	0.0 left	4.89	1.66	14.2	191	28.3	3.51	89.2	1.37	7.6 left	10.4
5	0.4 right	5.07	1.73	16.2	213	31.1	3.50	88.0	1.52	4.7 left	11.1
6	0.3 right	5.03	1.74	17.1	222	32.5	3.40	87.6	1.95	11.8 left	11.5
7	0.6 left	4.25	1.66	12.3	178	25.3	3.18	88.7	-1.13	10.1 left	10.4
-											
AV	**0.2 right**	**4.80**	**1.69**	**14.4**	**193**	**29.0**	**3.40**	**88.7**	**0.72**	**7.0 left**	**10.7**
SD	**1.03**	**0.28**	**0.044**	**1.73**	**17.8**	**2.79**	**0.132**	**0.76**	**1.11**	**3.33**	**0.45**

The Ball Performance graph lists relevant ball data for each putt in a table, including average values and SD values in the bottom lines.

- **Relative direction**
  The relative start direction is the direction of the putts directly at impact relative to the ideal putt direction. On a sloped green, the ideal putt direction is corresponding to the intended roll-out distance past the hole or by the desired entry speed into the hole (see Chapter 2.1).

- **Launch Speed**
  The launch speed is the speed of the ball immediately after impact. Since distance control in putting largely depends on how the ball behaves once it is rolling purely, a consistent launch speed is a critical factor for distance control of the putts.

- **Smash Factor**
  Measures how efficiently energy is transferred from the club to the ball at impact. Per definition the Smash Factor = Ball Speed ÷ Clubhead Speed. In general, a higher smash factor indicates a more efficient strike, and a lower smash factor a less efficient strike, e.g. because of off-center hits or poor energy transfer.

- **Skid Distance**
  The Skid Distance is the distance the ball travels immediately after impact until it transitions into true roll. During the skid phase phase, the ball may bounce or slide along the surface. It is characterized by significantly higher deceleration, as additional energy is required to overcome sliding and initiate pure rolling (see also Chapter 2.6).

- **Skid Time**
  The Skid Time is the time the ball needs immediately after impact until it transitions into true roll. The skid phase is characterized by significantly higher deceleration, as additional energy is required to overcome sliding and initiate pure rolling (see also Chapter 2.6).

- **Speed Drop**
  Speed drop is the amount of ball speed lost during this skid phase before the ball reaches pure roll. The longer the skid phase, the more energy is lost, the greater the loss of speed, and the less efficient the putt.

- **Roll Speed**
  The roll speed is the speed of the ball as it reached pure forward roll immediately after the skid phase, meaning that the rotational speed of the ball matches its forward speed (true roll condition). Since distance control in putting largely depends on how the ball behaves once it is rolling purely, a consistent roll speed is a critical factor for distance control of the putts.

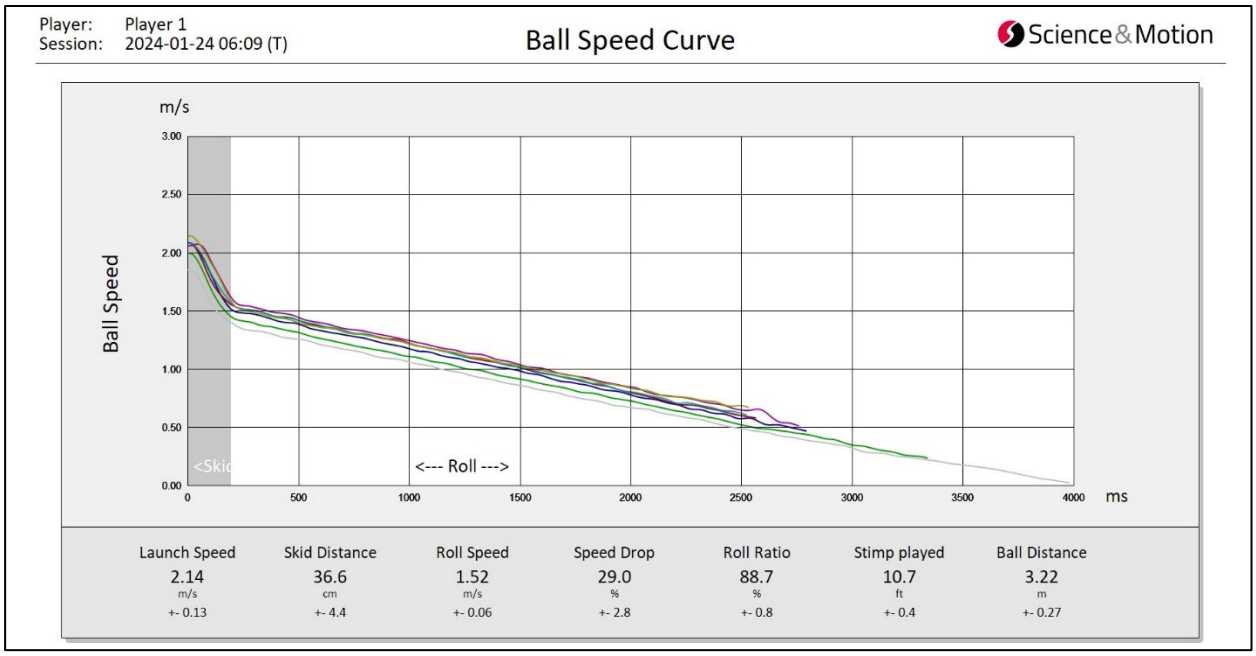
- **Roll Ratio**
  Roll ratio (expressed as a percentage) represents the proportion of total putt time during which the ball is in pure roll. Consequently, the remaining percentage up to 100% represents the skid ratio of the putt. The roll ratio is a measure of roll efficiency and quality of the strike. A higher roll ratio indicates that the ball achieved pure roll sooner in a more efficient putt.

- **Distance to hole**
  The absolute distance to/past the center of the of the putts. If a putt did not reach the hole the distance to hole is negative. If a putt was physically holed, the distance to hole is 0. In this case, if the “BT Sim” is switched on, then the putt path is further simulated until its predicted end position, and a corresponding realistic number for distance past hole is displayed.

- **Ball Side Position**
  The distance sideways (left or right) of the ball at end position relative to the center of the hole. If a putt was physically holed, the side position is 0. In this case, if the “BT Sim” is switched on, then the putt path is further simulated until its predicted end position, and a corresponding realistic number is displayed.

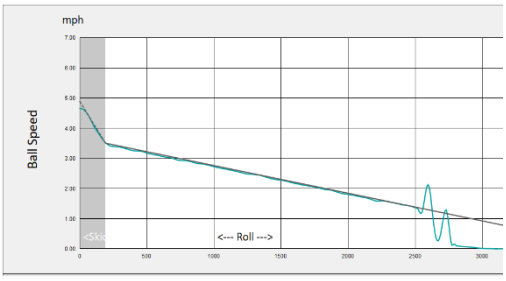
- **Stimp played (Effective Stimp)**
  Thes effective Stimp describes the playing speed of a green for a specific putt on a slope or break. While the Stimp value measures green speed on a flat surface, the effective Stimp accounts for the influence of gravity on sloped terrain: On a downhill putt the green effectively plays faster, on an uphill putt the green effectively plays slower. For breaking putts the ball can experience a combination of uphill and downhill conditions, relative to the direction of the fall line. Because of this, the same green can have different effective Stimp speeds depending on direction of the putts.

2.6 Page 6: Ball Speed Curves



The Ball Speed Graph shows the raw data which has been captured by the Balltracker software. The left axis refers to ball speed, und the horizontal axis shows the actual time of the putt. A regular putt on a fast green will take about 3.5-4 seconds on a Stimp 10-11 green until end position. The parameters on the lower part of the screen are already explained in Chapter 2.5. Under each parameters average value the corresponding standard deviation SD is displayed.

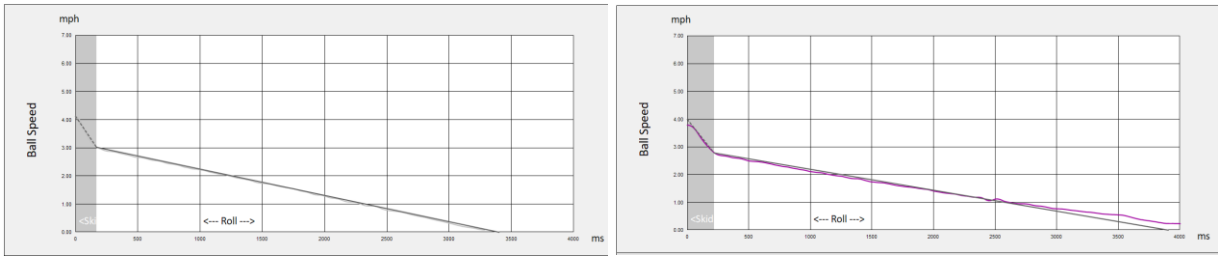
If a putt is holed or if the ball experiences a collision, the tracked data will display an irregular speed curve due to the impact or due to the ball bouncing in the hole. To still be able to calculate all ball parameters correctly, the **“BT Sim”** function must be enabled, which perfectly simulates the ball path until its predicted end position.



As you can see in the upper graph, the decrease of speed immediately after impact (on the left side of the curve) is much steeper than during the rest of the putt. This rapid deceleration corresponds to the **skid phase**, where extra energy is needed to overcome sliding and transition the ball into pure roll.

When switching to the single putt display mode (via the “Single” button on the toolbar), only one data curve is shown at a time, along with the corresponding linear regression lines for the skid and roll phases. The exact length of the skid phase is then defined by the intersection point of these two regression lines. The skid phase is highlighted in grey, and its parameters are calculated accordingly.

Once the ball achieves pure roll, it decelerates constantly at a lower rate until it stops (left graph). On sloped surfaces, gravity also affects the ball's motion. For faster putts, gravity has less influence, so the deceleration can be considered roughly linear. However, as the ball slows down—especially on downhill slopes—the deceleration decreases, causing the speed curve to flatten as the ball approaches its final position (right graph).



Ball rolling on a flat putt (left) and a breaking putt (right) where deceleration flattens out.

Please note: Since the ball-tracking camera records putts from above, small vertical movements of the ball (bounces) can cause apparent changes in the measured speed at the start. When the ball moves upward toward the camera at impact, the recorded speed may appear lower than the actual speed. This is visible in most ball speed curves at the very beginning, where the speed seems to start at a slightly lower level, followed by an increase as the ball returns to the surface. Adding the temporary reduction and subsequent increase gives the true launch speed.