



# ShotBridge

**with PuttLinx**

*User Guide*

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## 1. Introduction

ShotBridge is a software bridge that connects your physical launch monitor and putting camera to GSPRO, the premier golf simulation platform. It handles all communication between your hardware and the simulator so you can focus on your game.

### What is PuttLinx?

PuttLinx is the putting analysis engine built into ShotBridge. It uses your webcam and an AI-powered ball detection model to track the speed and direction of your putt in real time, delivering accurate miles-per-hour data and horizontal launch angle to GSPRO.

PuttLinx is designed to work alongside a full-swing launch monitor. GSPRO automatically switches between PuttLinx (putter) and your launch monitor (all other clubs) based on club selection — no manual switching required.

### Key Features

Feature	Description
Webcam-based putt detection	No additional hardware required beyond a USB camera
AI ball detection	ONNX-based YOLOv8 model detects the ball automatically — no color calibration needed
World-space speed calculation	Homography-based measurement converts pixel motion to real-world MPH
Horizontal launch angle (HLA)	Accurate direction detection for realistic putt break
Automatic arming	Arms itself when the ball is stationary — fires when it moves
Automatic club switching	Activates when putter is selected in GSPRO, deactivates for all other clubs
Ghost putt rejection	Ball placement and removal do not trigger false putts
Trackman OCR support	Full OCR-based integration with Trackman Performance Studio using dual-engine recognition
FS Golf Auto-Switch	Automatically clicks Full Swing / Chipping mode in FS Golf based on GSPRO distance
OBS overlay	Browser source overlay showing ball trail and putt speed for live streaming

### How It Works

When you select the putter in GSPRO, ShotBridge activates PuttLinx and waits for a ball to appear in the configured putting zone. Once the ball is detected and stationary, the system arms itself. When the ball moves, PuttLinx tracks it across the frame, calculates speed and direction using world-space calibration, and sends the result to GSPRO.

## 2. System Requirements

### Minimum Requirements

Component	Requirement
Operating System	Windows 10 or Windows 11 (64-bit)
Processor	Intel Core i5 / AMD Ryzen 5 or better
Memory	8 GB RAM minimum, 16 GB recommended
Storage	500 MB free disk space
Camera	USB webcam capable of 720p @ 60fps or better
Network	Local network connection to GSPro PC (or same machine)
GSPro	GSPro Connect API enabled (port 921)

### Recommended Camera Setup

For best results, use a camera with the following characteristics:

Setting	Recommendation
Resolution	1280x720 (720p) — optimal balance of speed and image quality
Frame rate	100fps at 720p strongly recommended. More frames per putt = more accurate speed and direction readings
Focus	Fixed or manual focus preferred — autofocus can cause tracking disruptions during a putt
Mount	Overhead or low side angle with a clear, stable view of the putting surface

■ 720p at 100fps delivers approximately 7–9 tracking frames per fast putt — significantly more than 1080p at 60fps. Higher frame rate matters more than higher resolution for PuttLinx accuracy.

■■ Any camera movement between calibration and use will affect accuracy. Use a stable mount and avoid bumping the camera. If the camera is moved, recalibrate from PuttLinx Setup.

## 3. Getting Started

### Launching ShotBridge

Double-click ShotBridge.exe to start the application. ShotBridge runs silently in the background — no console window appears. After a few seconds, your default web browser will automatically open to the ShotBridge interface at:

**http://localhost:3000**

If the browser does not open automatically, navigate to the address above manually.

■ ShotBridge adds a system tray icon (bottom-right of your taskbar) when it starts. If you accidentally close the browser window, right-click the tray icon to reopen the interface or exit the application.

■ ShotBridge writes a log file to the .shotbridge folder in your user profile directory (%USERPROFILE%\shotbridge\shotbridge.log). If something isn't working as expected, this file is the first place to look.

### Connecting to GSPPro

ShotBridge connects to GSPPro automatically on startup. The connection status is displayed in the top navigation bar. If GSPPro is not yet running when ShotBridge starts, it will reconnect automatically once GSPPro launches.

Ensure GSPPro Connect is enabled in GSPPro settings and that it is listening on the default port (921).

### Navigation

Page	Description
Dashboard	Live view of PuttLinX camera, GSPPro status, and shot history
PuttLinX Setup	Camera selection, detection zone configuration, and calibration wizard
LaunchMon Setup	Launch monitor connection and configuration
OBS Overlay	Configure the broadcast overlay for streaming
Settings	General application settings

### First-Time Setup Order

On a fresh install, complete setup in this order:

- 1 Open PuttLinX Setup — select your camera, resolution, and frame rate
- 2 Draw your detection zone and complete the homography calibration
- 3 Open LaunchMon Setup — select your launch monitor profile and connect
- 4 Return to the Dashboard and verify everything is connected

**5 Hit a few test putts to confirm detection and calibrate speed sensitivity**

## 4. Dashboard

The Dashboard is the main screen you will use during play. It provides a live view of the PuttLinx camera, your GSPro connection status, and a log of recent activity.

### Layout

The dashboard is divided into two main areas:

#### Left Panel — PuttLinx Camera

Displays the live webcam feed with the configured putting zone overlay. Below the camera is the PuttLinx status bar showing the current detection state.

Status	Meaning
Waiting	PuttLinx is active but no ball is detected in the zone
Hold Still...	Ball detected — waiting for it to become stationary before arming
Ready	Ball is stationary and PuttLinx is armed — ready to detect a putt
Putt!	Ball is moving — tracking in progress
Recorded	Putt complete — data has been sent to GSPro

#### Right Panel — Launch Monitor / Last Shot

When PuttLinx is ON and a shot or putt has been recorded, the Last Shot panel displays the most recently sent data — speed, launch angle, spin, and a source badge indicating whether the data came from PuttLinx or your launch monitor. This panel updates after every putt and every full shot, giving quick confirmation that data reached GSPro.

When no shot has been recorded yet, the panel shows a waiting state. When PuttLinx is turned OFF, the panel is hidden and the launch monitor view expands to full width.

#### PuttLinx Toggle

A PuttLinx ON/OFF toggle is available in the GSPro connection bar at the top of the dashboard. Use this to disable putting detection temporarily without changing your camera setup or calibration — for example, when playing a round where you want to chip from the mat instead of putt. The toggle state is saved between sessions.

#### Activity Log

A scrolling log at the bottom of the screen shows all recent events including putts detected, shots recorded, GSPro connection status, and system messages.

#### GSPro Status Bar

The top of the dashboard shows your GSPro connection status, current club selection, player handedness, and distance to the target. ShotBridge uses this information to automatically switch between PuttLinx and your launch monitor.

- Leave the Dashboard open during play. It gives you a real-time view of what PuttLinx is doing and confirms each putt was recorded before you move to the next shot.

## 5. PuttLinx Setup

Before using PuttLinx, you need to complete a one-time setup using the built-in wizard. Navigate to PuttLinx Setup from the top navigation bar. The wizard walks you through four steps.

### Step 1 — Select Camera

Choose your webcam from the list of detected cameras. ShotBridge will show all physical cameras connected to your PC — virtual cameras (OBS Virtual Camera, capture cards, etc.) are filtered out automatically.

After selecting a camera, configure the resolution and frame rate. 1280×720 at the highest available fps is recommended — most cameras that support 720p@100fps will deliver approximately 99 frames per second, providing significantly more tracking data per putt than lower frame rates.

■ If your camera does not appear in the list, click Rescan Cameras. Ensure the camera is plugged into a USB 3.0 port (blue) directly on the motherboard, and that it is not currently in use by another application such as OBS or Zoom.

### Step 2 — Capture Frame

Click Capture to take a snapshot from the camera. This is used as the reference image for zone configuration. Make sure your putting mat and full target area are visible in the frame before capturing.

■■ Ensure the lighting is consistent when you capture the reference frame. Significant lighting changes (such as turning overhead lights on or off) may affect ball detection and require reconfiguration.

### Step 3 — Define Zone & Calibrate

This step tells PuttLinx exactly where the ball will roll, and calibrates the world-space coordinate system so speed and direction are measured in real-world inches rather than pixels.

#### Drawing the Detection Zone

Click and drag on the captured image to draw a rectangle covering the ball's full travel path. This zone is the area PuttLinx monitors during play.

- 1 Click and drag on the camera preview to draw a rectangle covering the ball's travel path
- 2 Make the zone as long as possible in the direction the ball will travel — more length means more tracking frames and better accuracy
- 3 The zone should be wide enough to capture the ball at any reasonable aim angle
- 4 Click Save Zone when satisfied

■ The putting zone does not need to cover your entire mat — just the area the ball rolls through. A longer zone aligned with the putting direction gives better speed accuracy than a short or square zone. Zones of 48" or longer are recommended for the best results on long putts.

#### Homography Calibration

After drawing the zone, PuttLinx needs to know the real-world dimensions of the zone so it can convert pixel positions to inches. This calibration is what enables accurate MPH calculations.

- 1 Click Calibrate to begin
- 2 Place a golf ball at the near-left corner of your zone and click Capture
- 3 Move the ball to the near-right corner and click Capture
- 4 Move to the far-left corner and click Capture
- 5 Move to the far-right corner and click Capture
- 6 Enter the actual physical dimensions of your zone in inches
- 7 Click Save Calibration — a confirmation will show the pixels-per-inch ratio

■ The more accurately you place the ball at the zone corners during calibration, the better your speed and direction readings will be. Recalibrate any time you move the camera or change the zone size.

#### Step 4 — Test and Go Live

The final step lets you test PuttLinx before going live. Place a ball in the zone and roll it through — the system will detect the putt and display the measured speed and angle. When you are satisfied with the results, click Start Live Mode to activate PuttLinx for play.

Live Mode means putts will be automatically sent to GSPPro. In test mode, putts are measured and displayed but not forwarded to the simulator.

■ The HLA Flip Direction toggle is available if your camera angle causes the detected direction to be reversed. If straight putts are showing large negative angles, toggle this and recalibrate.

## 6. Putt Speed Calibration

PuttLinx calculates putt speed using world-space coordinates derived from the homography calibration performed during setup. The system measures actual physical distance traveled per unit time in real-world inches, converting to MPH. This means the speed calculation is self-calibrated to your specific camera position and zone dimensions.

The Sensitivity slider on the Dashboard applies a fine-tuning multiplier on top of the physics calculation to account for mat friction, ball type, and other real-world variables.

### Sensitivity Setting

Setting	Effect
Lower sensitivity	Reduces the MPH value sent to GSPPro — use if putts are going too far
Higher sensitivity	Increases the MPH value sent to GSPPro — use if putts are coming up short

### Calibration Approach

The best way to calibrate PuttLinx is to putt to a known distance in GSPPro and adjust sensitivity until the simulated result matches your expectation:

- 1 Set up a 10-foot straight putt in GSPPro on a flat green
- 2 Putt at what feels like a firm, confident pace to reach the hole
- 3 Note how far the simulated ball travels compared to the hole
- 4 If consistently long, reduce sensitivity. If consistently short, increase sensitivity
- 5 Repeat until results feel natural and consistent

### Stimp 11 Reference Table (Flat Green)

Use the table below as a reference when calibrating sensitivity on a Stimp 11 green. Putt to a known distance and compare the speed PuttLinx sends to GSPPro against the expected value. Adjust sensitivity until the simulated distance matches.

Speed	Distance	Speed	Distance
3.0 MPH	6'5"	7.0 MPH	25'8"
3.5 MPH	8'6"	7.5 MPH	28'2"
4.0 MPH	10'7"	8.0 MPH	30'10"
4.5 MPH	12'8"	8.5 MPH	33'11"
5.0 MPH	15'1"	9.0 MPH	37'1"
5.5 MPH	17'7"	9.5 MPH	40'2"
6.0 MPH	20'4"	10.0 MPH	43'2"

6.5 MPH	23'0"		
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- Once your sensitivity is dialed in for a given camera height and mat, note the value. It rarely needs adjustment unless the camera is moved or the mat is changed.

### Ghost Putt Filter

PuttLinx includes a minimum speed threshold that ignores any detection below 1.5 MPH. This prevents accidental putts being registered when you place or remove the ball from the zone. If a putt is detected but the speed is below this threshold, it is silently discarded and the system re-arms.

## 7. Playing a Round

Once PuttLinx is configured and live, playing is straightforward. ShotBridge handles all switching between your launch monitor and PuttLinx automatically based on club selection in GSPRO.

### Normal Shot Flow

- 1 Select your club in GSPRO as normal
- 2 For all clubs except the putter, hit your shot using your launch monitor
- 3 When you reach the green, select the putter in GSPRO
- 4 ShotBridge automatically activates PuttLinx
- 5 Place your ball in the putting zone
- 6 Wait for the status to show Ready (green indicator)
- 7 Putt — ShotBridge will detect and send the result to GSPRO automatically
- 8 The Activity Log confirms the putt was recorded with speed and direction

### Automatic Club Switching

ShotBridge monitors GSPRO for club changes and switches automatically:

Condition	Action
Putter selected	PuttLinx activates — webcam tracking begins
Any other club selected	PuttLinx deactivates — launch monitor takes over
Back to putter	PuttLinx reactivates automatically

■■ A putt will only register in GSPRO if the putter is currently selected. If you accidentally roll the ball through the zone with a different club active, the putt will be detected by the camera but discarded without sending to GSPRO.

### Between Putts

After each putt, PuttLinx automatically resets and re-arms when you place the ball back in the zone. You do not need to click anything between putts.

The status bar will cycle through: Waiting → Hold Still... → Ready → Putt! → Recorded, and then back to Waiting when the ball is removed, or directly back to Hold Still when the ball is repositioned.

### Multiplayer and Match Play

ShotBridge tracks the GSPRO shot counter and player information. In multiplayer rounds, PuttLinx will arm and ready itself for the appropriate player's turn based on who has the putter selected in GSPRO.

## 8. Launch Monitor Configuration

ShotBridge supports two different methods for connecting your launch monitor to GSPro. Which method is used depends on your launch monitor hardware and is controlled by the active Profile.

### Profiles

A Profile is a collection of settings that tells ShotBridge how to communicate with your specific launch monitor. Profiles define field mappings, connection method, and any device-specific corrections. ShotBridge ships with built-in profiles for many popular launch monitors.

To select a profile, navigate to LaunchMon Setup from the top navigation bar. The Profile selector appears at the top of the page.

■ You only need to select a profile once. ShotBridge remembers your active profile between sessions and restores it automatically on startup.

### The Two Connection Methods

#### Mevo+ with FS Golf App (FS Golf Listener)

If you are using a Mevo+ launch monitor running the FlightScope FS Golf PC app, ShotBridge connects directly to FS Golf over your local network. This is the most reliable method — data arrives digitally with no image processing involved.

#### Setup

- 1 Select the “Mevo+ (FS Golf)” profile in LaunchMon Setup
- 2 ShotBridge automatically detects the FS Golf window in the background
- 3 The LaunchMon tab goes directly to the Live view — no OCR configuration needed
- 4 Ensure FS Golf PC is running and connected to your Mevo+
- 5 ShotBridge will connect automatically and show “FS Golf Listener Connected” in the log

#### FS Golf Auto-Switch (Full Swing / Chipping)

FS Golf requires you to manually switch between “Full Swing” and “Chipping” mode in its interface depending on your distance to the hole. ShotBridge automates this for you.

When configured, ShotBridge monitors your distance to the pin reported by GSPro and automatically clicks the Full Swing or Chipping button in the FS Golf window whenever the distance threshold is crossed.

To configure button positions:

- 1 Navigate to LaunchMon Setup → Live Shot Detection → FS Golf Auto-Switch
- 2 Set your distance threshold (default 30 yards — shots within this distance trigger Chipping mode)
- 3 Click “Set Full Swing Position” — a screenshot of the FS Golf window will appear
- 4 Click on the Full Swing button in the screenshot
- 5 Click “Set Chipping Position” and repeat for the Chipping button

## 6 Positions are saved automatically — ShotBridge will click these buttons going forward

■ Make sure FS Golf is in its normal layout when capturing button positions. If you rearrange the FS Golf window panels, you will need to reconfigure the button positions.

■■ On high-DPI monitors (125% scaling or higher), ShotBridge automatically compensates for display scaling when calculating click positions. If clicks are landing in the wrong place, recapture the button positions with FS Golf at its normal size.

## OCR Launch Monitors (LaunchMon)

For all other supported launch monitors, ShotBridge uses OCR (Optical Character Recognition) to read shot data directly from the launch monitor software window on screen. ShotBridge takes periodic screenshots of the window and extracts the numeric values for ball speed, launch angle, spin, and other metrics.

### LaunchMon Setup Steps

- 1 Select the appropriate profile for your launch monitor in LaunchMon Setup
- 2 With your launch monitor software open, click “Select Window” and choose it from the list
- 3 Click “Capture” to take a reference screenshot
- 4 Verify the capture regions (ROIs) are correctly aligned with the data fields on screen
- 5 Click “Test OCR” to confirm values are being read correctly
- 6 Click “Start Polling” to begin live shot detection
- 7 Hit a shot and verify the data appears in the Shot History table

■ The LaunchMon panel on the Dashboard shows the last detected shot, shot count, and polling status. If polling is active but no shots are being detected, verify the launch monitor software window is visible on screen and not minimized or covered.

## Trackman

Select the “Trackman” profile in LaunchMon Setup. ShotBridge uses OCR to read data from the Trackman Performance Studio window. Two OCR engines work in combination: WinRT OCR handles most fields, and a bundled Tesseract engine automatically handles Launch Direction and Spin Axis, which are displayed on a dark background in Trackman’s interface and require a different recognition approach. No configuration is needed — the fallback is automatic.

Setup follows the same steps as other OCR-based profiles: select the Trackman Performance Studio window, draw ROIs over the six data fields, run Test OCR to confirm all fields read correctly, then Start Polling.

■■ After updating to a new version of ShotBridge, you must re-draw your ROIs. Capture returns the full physical window image — ROIs drawn in older versions may be misaligned if the window size has changed.

## 9. Troubleshooting

### PuttLinx Not Detecting the Ball

If the ball is in the zone but the status stays on Waiting:

Check	Action
Ball position	Verify the ball is fully within the configured putting zone boundaries
Zone calibration	Recalibrate the zone if the camera has moved since setup
Camera preview	Check that the preview is updating — look for movement in the frame
Shadows	Ensure the ball is not partially obscured by shadow or other objects
Ball type	Standard white golf balls work best. Unusual ball colors or patterns may reduce confidence scores
Detection confidence	Check the console — low confidence scores (below 0.25) may indicate a lighting issue

### Putts Not Sending to GSPro

If putts are detected (Recorded shows in the status) but nothing happens in GSPro:

Check	Action
GSPro connection	Verify GSPro shows as Connected in the ShotBridge status bar
Club selection	Ensure the putter is selected in GSPro — putts are blocked for all other clubs
Activity Log	Check the log for any error messages
Restart	Restart GSPro and allow ShotBridge to reconnect automatically

### Speed Readings Are Inconsistent

If putt speed varies significantly between similar-feeling putts:

Check	Action
Camera stability	Ensure the camera is firmly mounted with no vibration or movement
Ball visibility	Confirm the ball is fully visible in the zone from start to finish of the putt
Zone length	A longer zone gives more tracking frames and more accurate speed. Consider enlarging and recalibrating
Frame rate	If camera is below 60fps, switch to 720p mode which typically delivers higher frame rates

Calibration	Redo the homography calibration — ensure ball placement at zone corners was accurate
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## OCR Not Reading Fields Correctly (OCR-based launch monitors)

If Test OCR returns empty or incorrect values for some fields:

Check	Action
ROI alignment	Recapture the window and re-draw ROIs. Ensure each box tightly covers only the data value, not the label.
Window visibility	The launch monitor window must be fully visible and not covered by other windows.
Shot on screen	OCR reads whatever is currently displayed. Make sure a recent shot is showing before running Test OCR.
Trackman fields	Launch Direction and Spin Axis use a Tesseract fallback automatically. If these fields still fail, check the OCR debug images in <code>.shotbridge/ocr_debug/</code> .

## Camera Not Appearing in List

Check	Action
USB port	Use a USB 3.0 port (blue) directly on the motherboard, not a hub
Other apps	Close any app that may have exclusive camera access (OBS, Zoom, Teams, OBSBOT Center)
Virtual cameras	Virtual camera software (OBS Virtual Camera, PRISM) is filtered automatically — this is expected
Replug	Unplug and replug the camera USB, then click Rescan

## Camera Feed Is Black or Not Updating

Check	Action
Camera selected	Verify the correct camera is selected in PuttLinx Setup
Exclusive access	Ensure no other application has the camera open
USB	Try unplugging and replugging the USB cable
Drivers	Check Windows Device Manager for any camera driver errors

## GSPPro Disconnects Repeatedly

Occasional disconnects are normal if GSPPro restarts a round or loads a new course. ShotBridge reconnects automatically. If disconnects are frequent:

Check	Action
GSPPro Connect setting	Verify GSPPro Connect is enabled and set to port 921
Firewall	Check that no firewall is blocking local connections on port 921
Network	Ensure ShotBridge and GSPPro are on the same machine or local network

### Browser Shows a Blank Page

Check	Action
Console window	Verify ShotBridge.exe console is still running — do not close it
Refresh	Try refreshing the browser page (F5 or Ctrl+R)
Navigate manually	Go to <a href="http://localhost:3000">http://localhost:3000</a> directly in your browser
Console errors	Check the ShotBridge log file at %USERPROFILE%\shotbridge\shotbridge.log for error messages

## 10. Tips for Best Results

### Camera Placement

Tip	Details
Mount overhead	Looking straight down gives the most consistent ball tracking and makes zone alignment easier
Side angle	If used, keep it low and ensure the ball does not appear to “jump” vertically when rolling
Zone length	The longer the visible putting path in frame, the more tracking frames PuttLinx collects. 48–60 inches is ideal.
Avoid fore-aft angle	If the ball rolls toward or away from the lens, tracking is less reliable. Sideways motion is tracked best
Stable mount	Any camera movement after calibration will require recalibration

### Lighting

Tip	Details
Consistent lighting	Diffuse, even lighting produces the most reliable ball detection
Avoid windows	Direct sunlight or bright windows in the camera's view change throughout the day
Even illumination	If using overhead lights, ensure they illuminate the putting surface without harsh shadows
After lighting changes	If you change your lighting significantly, redo zone calibration to ensure accuracy

### Putting Surface

Tip	Details
Contrast	A surface color that contrasts with a white ball works best
Avoid patterns	Avoid prominent patterns or textures that could confuse the AI model
Clear zone	Keep the putting zone clear of debris, alignment aids, or other round objects

### Sensitivity Tuning

Tip	Details
Practice first	Spend a few minutes on the practice green in GSPro before your first round
Note your value	Once calibrated, note your sensitivity setting — you can restore it if accidentally reset

Stability	Once correct for your setup, sensitivity rarely needs adjustment unless the camera is moved
Short vs long	If short putts feel right but long putts are off, use the Stimp reference table in Section 6 to verify both distances

■ The most common cause of “putts feel off” is sensitivity being slightly too high or too low. Spend a few minutes on the practice green at multiple distances before your first round to dial it in.

## 11. Quick Reference

### Status Indicators

Status	Meaning
Waiting	PuttLinx active, no ball in zone
Hold Still...	Ball detected, waiting for it to stop moving
Ready	Armed and waiting for your putt
Putt!	Ball motion detected — tracking in progress
Recorded	Putt complete and sent to GSPro

### Important URLs

Service	Address
ShotBridge Interface	http://localhost:3000
OBS Browser Source	http://localhost:8766/overlay

### Default Ports

Service	Port
ShotBridge WebSocket	8765
ShotBridge Frontend	3000
OBS Overlay HTTP	8766
GSPro Connect	921

### Setup Checklist

Step	Action
1 — Camera	PuttLinx Setup → Select camera, resolution (720p), and max fps
2 — Zone	PuttLinx Setup → Draw detection zone over the putting path (longer = better)
3 — Calibrate	PuttLinx Setup → Place ball at zone corners, enter real dimensions
4 — Test	PuttLinx Setup → Roll test putts, confirm speed and HLA readings
5 — Launch Monitor	LaunchMon Setup → Select profile, connect to launch monitor
6 — Auto-Switch	LaunchMon Setup → Configure FS Golf button positions if using Mevo+ / FS Golf

7 — Sensitivity

Dashboard → Practice green, tune sensitivity slider to match feel

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