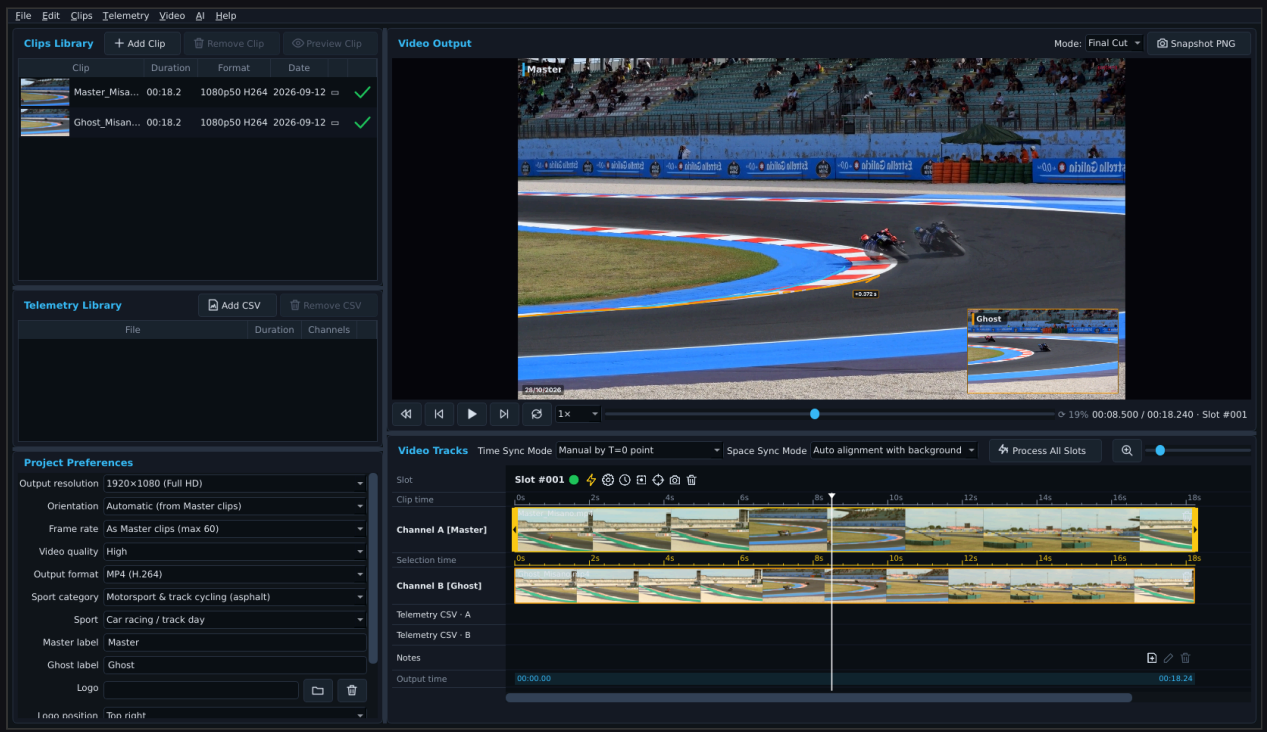
GUBELLINI VectorVision

User Manual

Comparative video analysis for sport · Revision 015 · October 2026



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1 Introduction

GUBELLINI VectorVision compares two recordings of the same stretch of track: the **Master** (the main video) and the **Ghost** (the comparison video), which appears over the Master like a transparent opponent. The program aligns the two recordings in space and time by itself, draws the **trajectories** on the ground, computes the live **time delta**, the times at **virtual gates**, the **speeds** (km/h with metric calibration), the **body angles** with artificial intelligence, and overlays the **telemetry** of data loggers. The result is arranged in **slots** and exported as a video ready to share.

It works both with tripod footage and with a **handheld smartphone**: a preliminary camera analysis recognises how each clip was shot and picks the processing strategies by itself.

1.1 How this manual is organised

The chapters follow the normal workflow: tiers and installation, the interface, the project with clips and slots, subject selection, synchronisation, slot configuration, processing, gates, telemetry, the AI assistant and export. Examples and pictures are made with a **sample project** shot with a handheld smartphone at the Misano circuit.

Sample project	Value
File	`Misano.gvv` with the clips `Master_Misano.mp4` and `Ghost_Misano.mp4`
Video	1920×1080, 50 fps, about 18 s each, handheld smartphone
Sport	Motorcycle racing (lean angle and contact point active)
Synchronisation	Time Sync *Manual by T=0 point*, Space Sync *Auto Alignment With Background*
Detected camera	Wide sweep (pass in front of the spectator) for both clips

> **Mirrored pictures**
> The footage of the sample project has been mirrored left–right: lettering, sponsors and track appear reversed and do not represent real events or brands.

1.2 Conventions

- **Bold**: names of menus, buttons and windows as they appear in the program (e.g. **File → Open Project…**).
- `Ctrl`+`O`: keyboard shortcut (full list in chapter 20).
- Some technical labels (Channel A [Master], Slot Config, Time Sync Mode…) stay in English in every language.

> **Language**
> The program is available in Italian, English, French, German, Spanish and Portuguese (**File → Preferences… → Language**); the language changes at once, without restarting.

2 Tiers and license

GUBELLINI VectorVision is sold as a subscription in three tiers: **Track**, **Pro** and **Team**. All include the core of the program (Ghost, synchronisation, trajectories, lean angle and contact point, gates and splits, camera analysis, export, updates and 6 languages).

	Track	Pro	Team
For	Amateur riders, track days, video creators	Racing riders, single instructors	Teams, racing schools, circuits, video productions
Monthly price (VAT incl.)	€12	€34	€89
Yearly price (VAT incl.)	€99	€299	€790
Activatable PCs	1	1	5
Ghost, synchronisation, trajectories	Yes	Yes	Yes
Lean angle and contact point	Yes	Yes	Yes
Export	Full HD with a small VectorVision logo	No logo, maximum resolution	No logo, with the customer's logo
CSV telemetry (AiM, MoTeC, VBOX)	No	Yes	Yes
Body angles, freeze-frame notes	No	Yes	Yes
AI assistant and AI workspace	No	Yes (user's key)	Yes (user's key)
Commercial use	No	Yes, single professional	Yes
Support	Email	Priority email	Priority + online onboarding session

Full specifications are in the document **“GUBELLINI VectorVision — Tiers and specifications”** shipped with the program.

2.1 Free trial and activation

1. At the first start a **7-day free trial** begins with all the features (Team tier), no credit card needed.
2. After the purchase the license key arrives by email.
3. Open **Help → License…**, paste the key and press **Activate on this PC**.
4. The window shows the active tier; the features unlock at once.

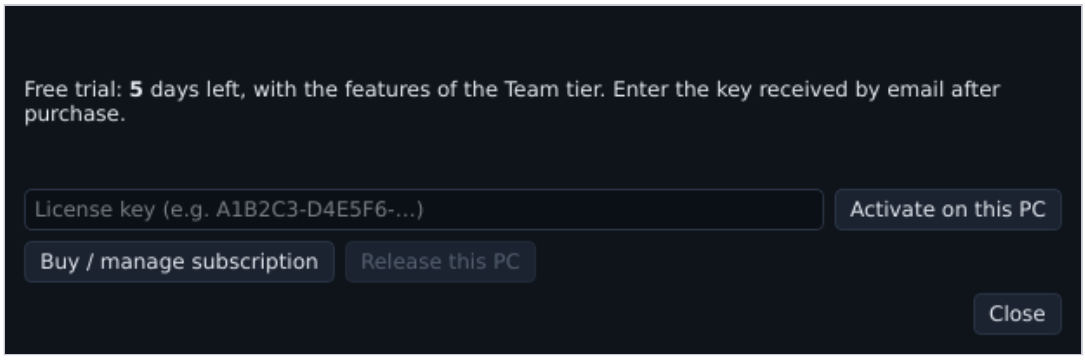


Figure 1 – The License window: status, key, purchase and releasing the PC.

> **Working offline**
>
> The key is verified online at activation and then periodically; between checks the program works **offline for up to 14 days**.

2.2 Moving the license to another PC

On the old PC press **Release this PC** in the License window, then activate the same key on the new one. With the Team tier the same key activates 5 PCs.

> **When the trial ends**
>
> The program still opens projects, but processing and export ask for a license key.

3 Installation and start

3.1 Requirements

- Windows 10 or 11 64-bit, 8 GB of RAM (16 GB recommended), screen of at least 1600×900.
- Graphics card optional: when present, export uses the hardware encoder.
- MP4/MOV H.264 or H.265 videos, any resolution and frame rate (1080p at 50/60 fps recommended).
- Internet connection for license activation, updates and the AI assistant.

3.2 Installing with the installer

1. Run `GUBELLINI_VectorVision_Setup.exe` and follow the wizard.
2. Choose the folder and, if you wish, the desktop icon.
3. At the end start the program from the last page of the installer or from the Start menu.

> **Updating without losing settings**
>
> Every new revision replaces the installed one (the program always appears in Windows as **GUBELLINI VectorVision**); projects, preferences and license are kept. The installed revision is in the window title and in **Help → About GUBELLINI VectorVision**.

3.3 Portable version

Alternatively extract the `.zip` package into a folder and double-click `run.bat`: the first start prepares a private environment (internet needed, a few minutes), later starts take a few seconds.

3.4 First start

At the first start the window is empty: the libraries are ready for the clips and the timeline invites you to drag the first clip onto **Channel A [Master]**.

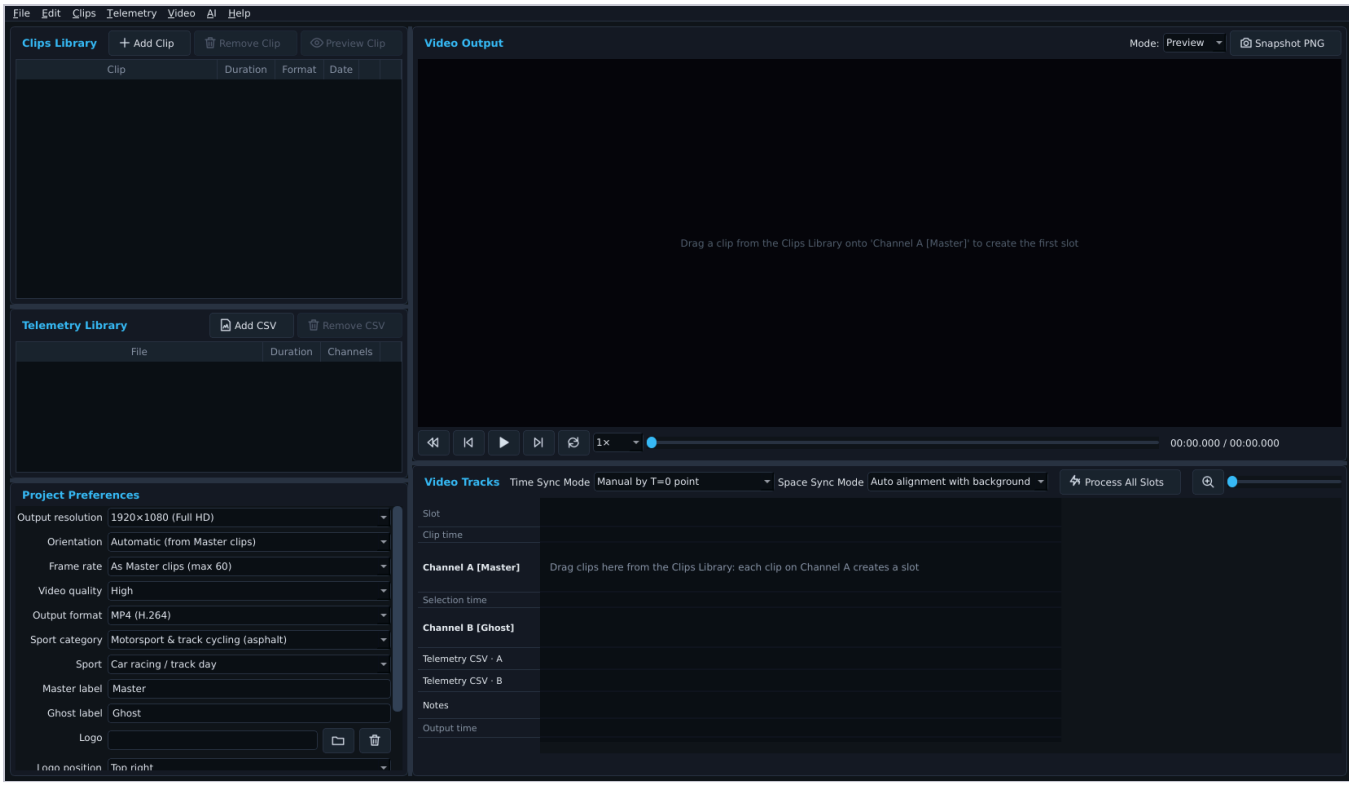


Figure 2 – The main window at the first start, without a project.

4 The interface

The main window is divided into resizable zones. Their sizes are saved with **File → Save Windows** and restored with **File → Reset Windows**.

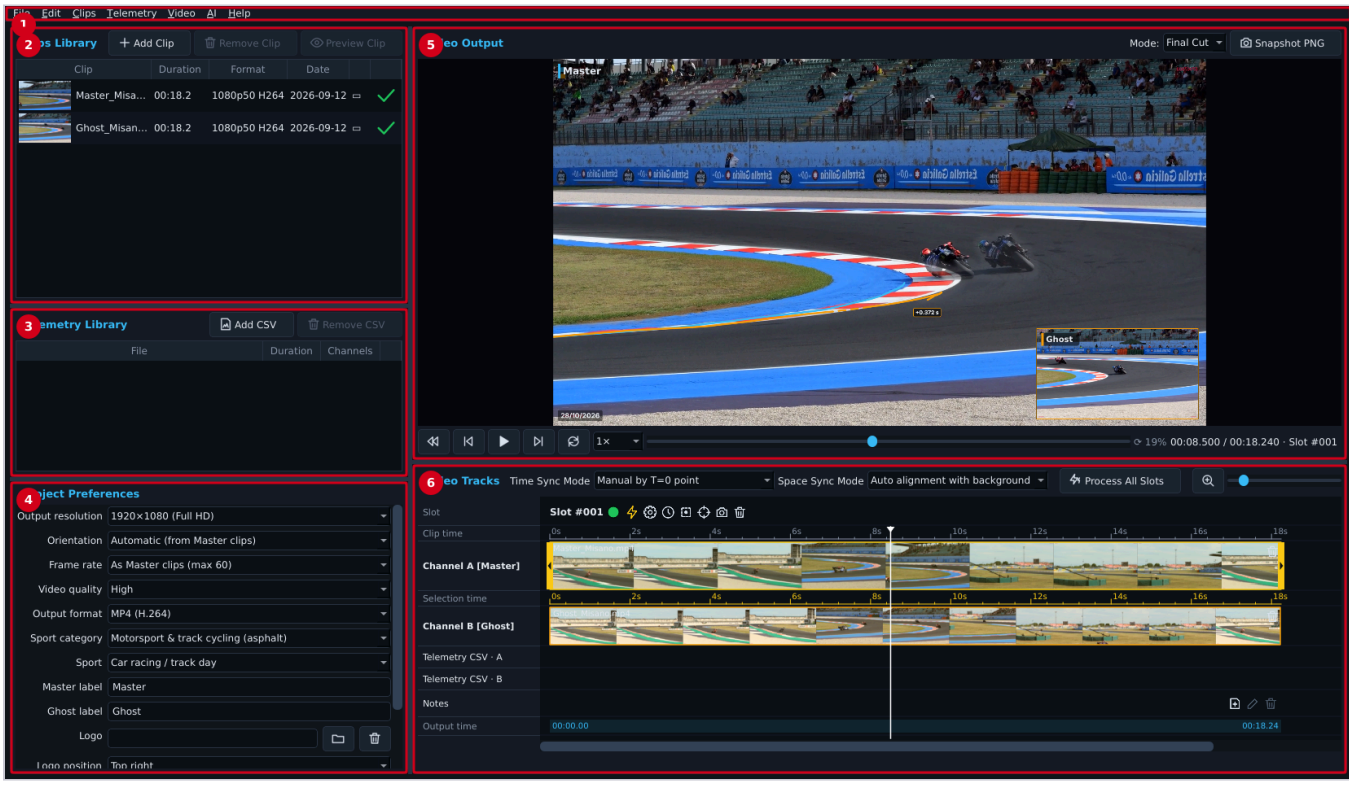


Figure 3 – The zones of the main window with the sample project.

1. **Menu bar**: File, Edit, Clips, Telemetry, Video, AI, Help.
2. **Clips Library**: the project videos with duration, fps and preview.
3. **Telemetry Library**: the data logger CSV files (Pro/Team).
4. **Project Preferences**: sport, output resolution and quality, labels, logo and date.
5. **Video Output**: preview and playback, in *Preview* or *Final Cut* mode.
6. **Video Tracks**: the slot timeline with Master and Ghost channels, telemetry and notes.
7. **Status bar**: messages and progress.

4.1 Menus

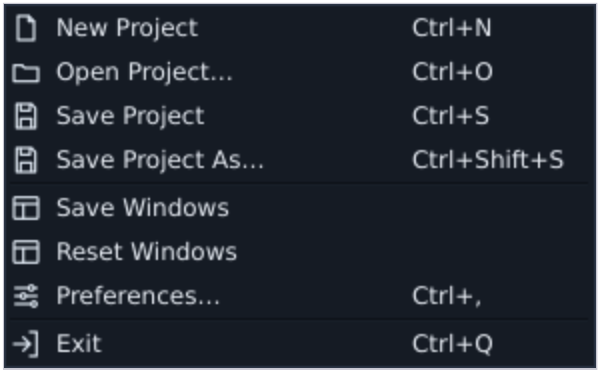


Figure 4 – The File menu.

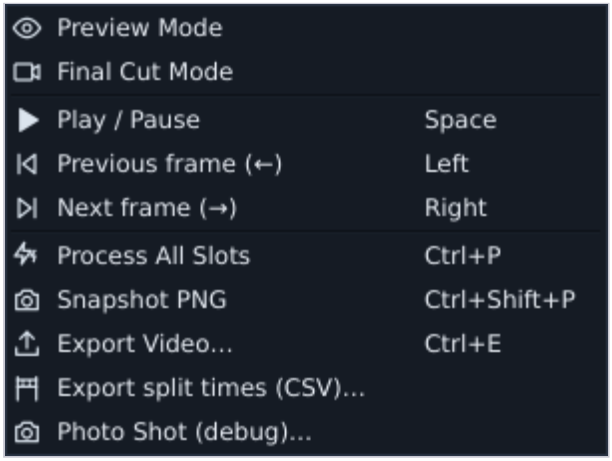


Figure 5 – The Video menu.

Menu	Commands
File	New / Open / Save project, Save and Reset Windows, Preferences, Exit.
Edit	Undo and Redo (with the name of the operation).
Clips	Add, remove and preview a clip.
Telemetry	Add and remove CSV files.
Video	Preview / Final Cut mode, Play, previous/next frame, Process All Slots, Snapshot PNG, Export Video, Export split times, Photo Shot.
AI	AI assistant, Configure AI, AI workspace folder.
Help	Quick Guide, License, Check for Updates, update server, About.

4.2 Help popups

Every option of the slot configuration has a **help popup**: hovering the option shows a card that explains what it does, when to use it and what it costs in processing time.

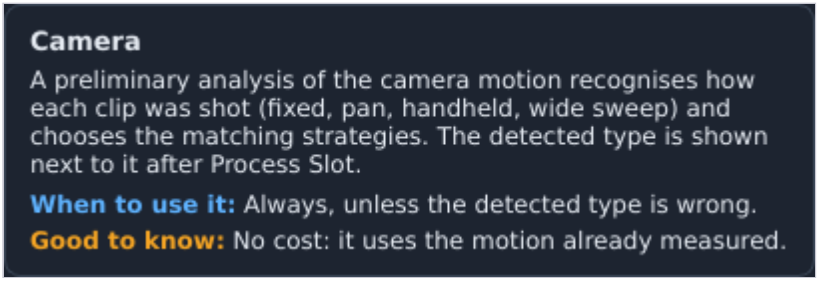


Figure 6 – The help popup of the Camera choice.

5 Project, clips and slots

A **project** (`.gvv` file) holds the imported clips, the telemetry CSVs and the **slots**. A slot is one comparison: a Master clip, an optional Ghost clip, the range to use and the chosen analyses. Slots in a row form the final video.

5.1 Importing clips

1. **Clips → Add Clip** (`Ctrl`+`I`) or drag the files onto the Clips Library.
2. In the preview window check the videos and confirm with **Add to Clips Library**.

> **Moved files**
> The project also remembers the relative path of the clips: moving the project folder together with the videos, everything reopens. If a file is missing, the **Relink missing files** window helps to find it.

5.2 Creating a slot

1. Drag the Master clip from the Clips Library onto **Channel A [Master]**: the slot is created.
2. Drag the Ghost clip onto the same slot in **Channel B [Ghost]**.
3. Shorten the slot by dragging its edges (trim) to keep only the interesting stretch.

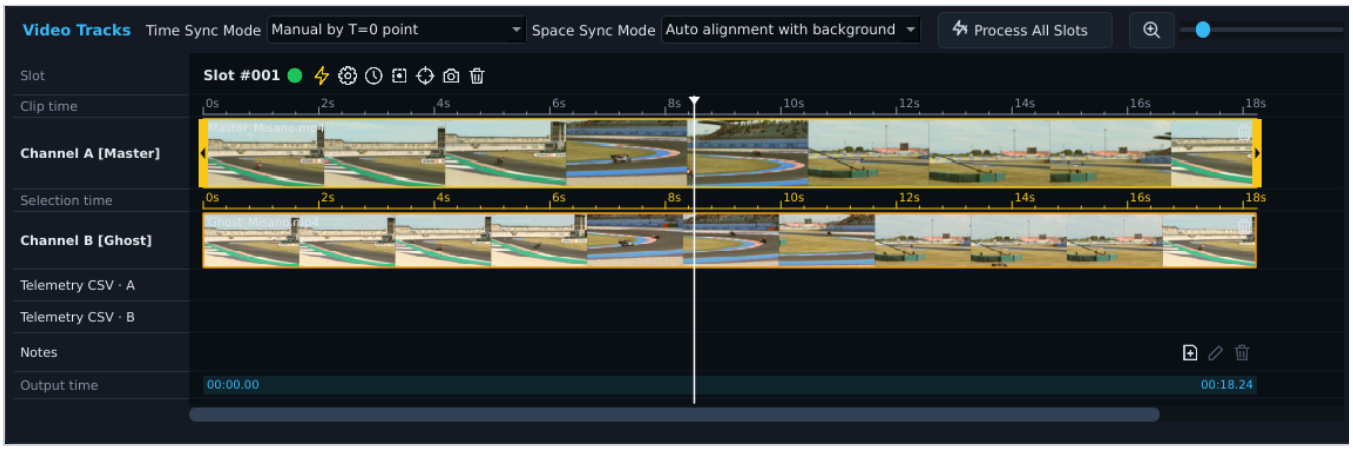


Figure 7 – The Video Tracks zone with one slot: channels A and B, telemetry, notes and the slot buttons.

5.3 The slot light

Colour	Meaning
Green	Processed slot: preview and export show the Ghost and the analyses.
Yellow	Something changed (subjects, synchronisation, options): **Process Slot** is needed.
Red	Error: the message explains the cause (e.g. missing subjects).

5.4 The slot buttons

- **Process Slot**: processes the slot (chapter 9).
- **Slot Config**: the configuration (chapter 8).

- **Sync Time (T=0)** and **Sync Space**: manual synchronisations (chapter 7).
- **Select subjects** (chapter 6), **Virtual gates** (chapter 10), **Photo Shot** (chapter 15).
- In the Notes row: add, edit and remove notes.

6 Selecting the subjects

The program must know **who** to compare: in one frame of each clip draw a rectangle around the vehicle (or athlete) and click its **reference point**, for example the tyre contact with the asphalt. From there the subject is measured on every frame by separating it from the background.

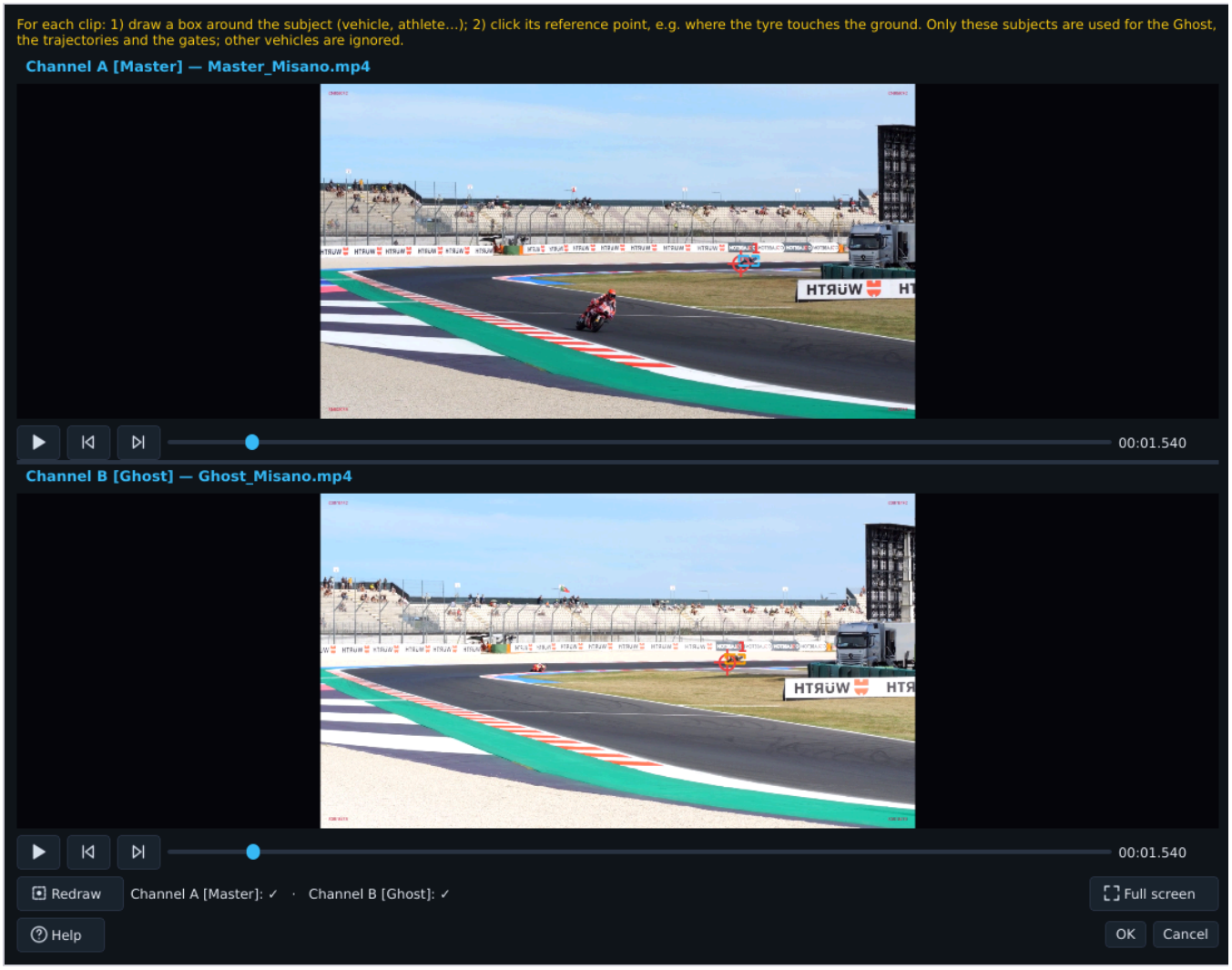


Figure 8 – The Select subjects window: Master above, Ghost below, with the subject boxes.

1. Open **Select subjects** from the slot.
2. Pick a frame where the subject is sharp and well apart from other vehicles.
3. Draw the rectangle around the subject, then click the reference point (e.g. the tyre on the ground).
4. Repeat on the Ghost and confirm with **OK**.

Loupe and full screen

The window can be maximised; the full-screen button or F11 give the most room. A 3× loupe on the cursor helps to place corners and ground point precisely.

Motorcycles: lean angle and contact point

With the *Motorcycle racing* sport the program measures the lean of the silhouette on every frame and keeps the point on the tyre on the ground even at full lean; the click only tells whether you mean the front tyre, the rear tyre or a point along the wheelbase.

7 Synchronisation

7.1 Time synchronisation (Time Sync Mode)

Mode	Use
Manual by T=0 point	You mark the same instant in both clips (e.g. crossing the same line). Always available.
Auto Alignment With Background	For cameras following the subject: compares the views. Does not work with a fixed camera.
Follow subject	Finds when the Ghost passes the spot where the Master is in the reference frame. The most precise.
Gate 1	Synchronises on the instant each subject crosses gate 1, measured in each clip.

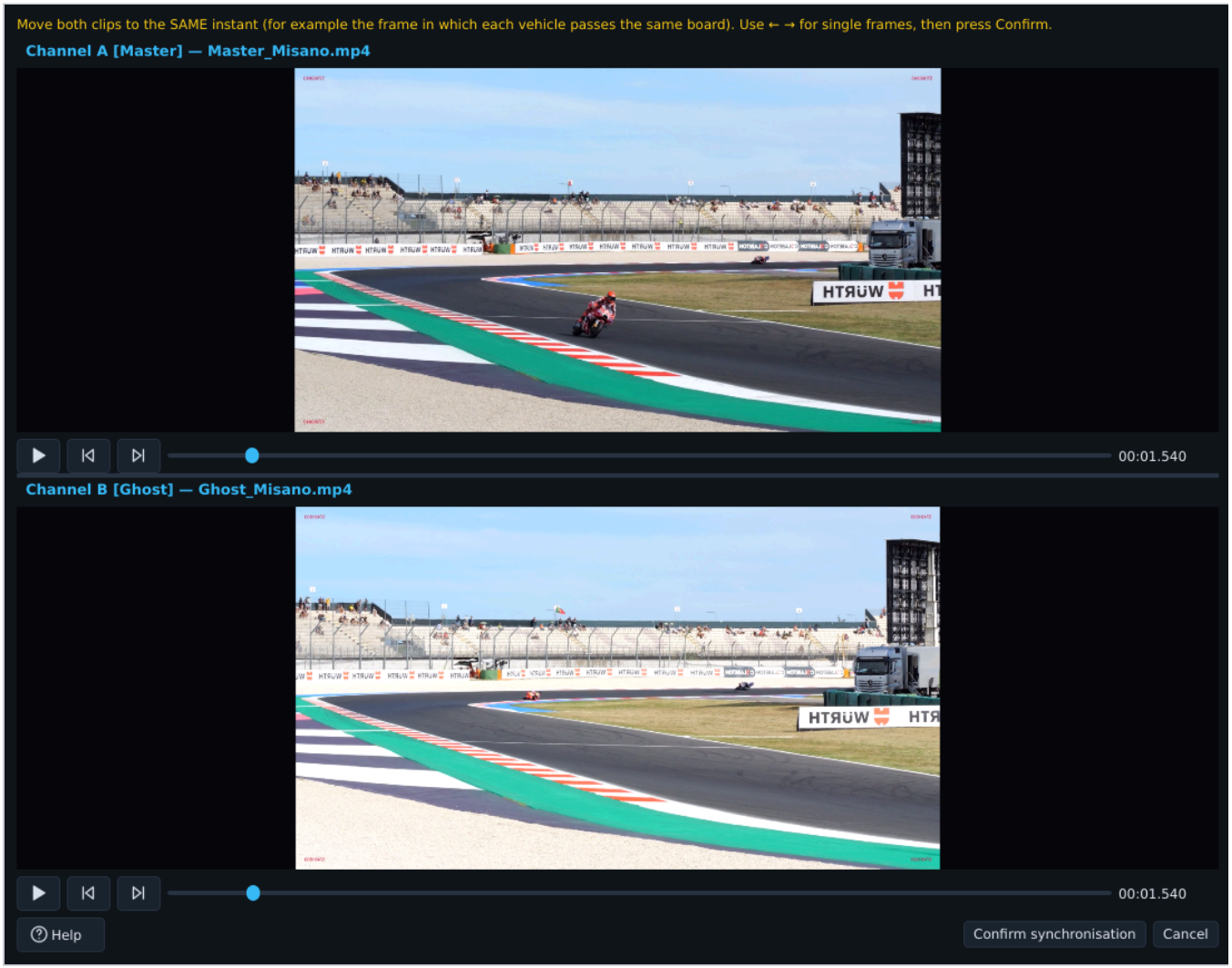


Figure 9 – The Sync Time window: each clip is brought to the T=0 instant.

7.2 Space synchronisation (Space Sync Mode)

- **Auto Alignment With Background** (recommended): background alignment is automatic, also with a handheld smartphone.

- **Manual by clicking 4 points**: click the same 4 fixed ground points in both clips.

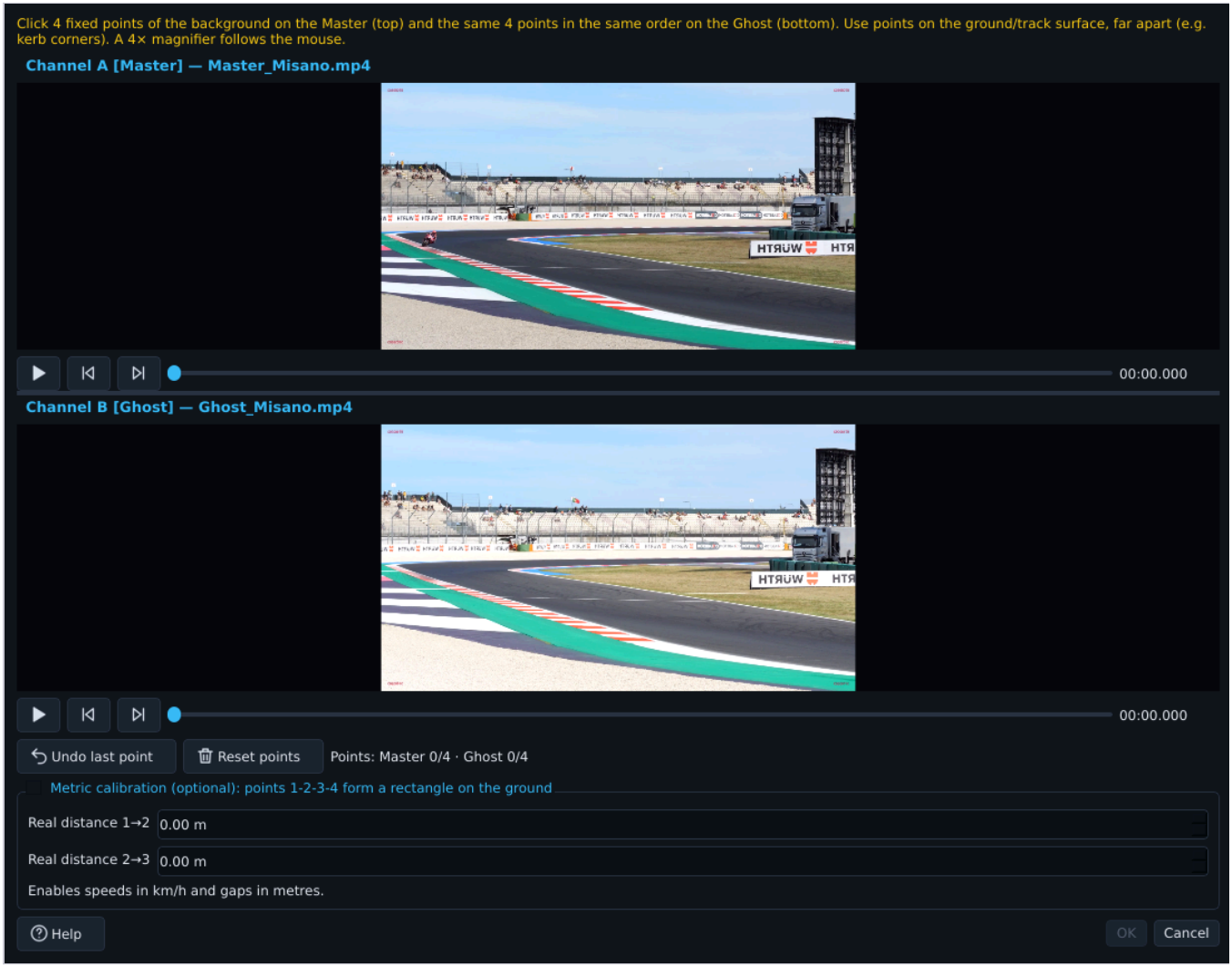


Figure 10 – The Sync Space window for the 4 points and metric calibration.

Metric calibration

If the 4 points form a ground rectangle of known size (e.g. between kerb lines), enter its real width and length: speeds in km/h and gaps in metres.

8 Slot Config

Double-click the slot or press **Slot Config**. Every option has its own help popup.

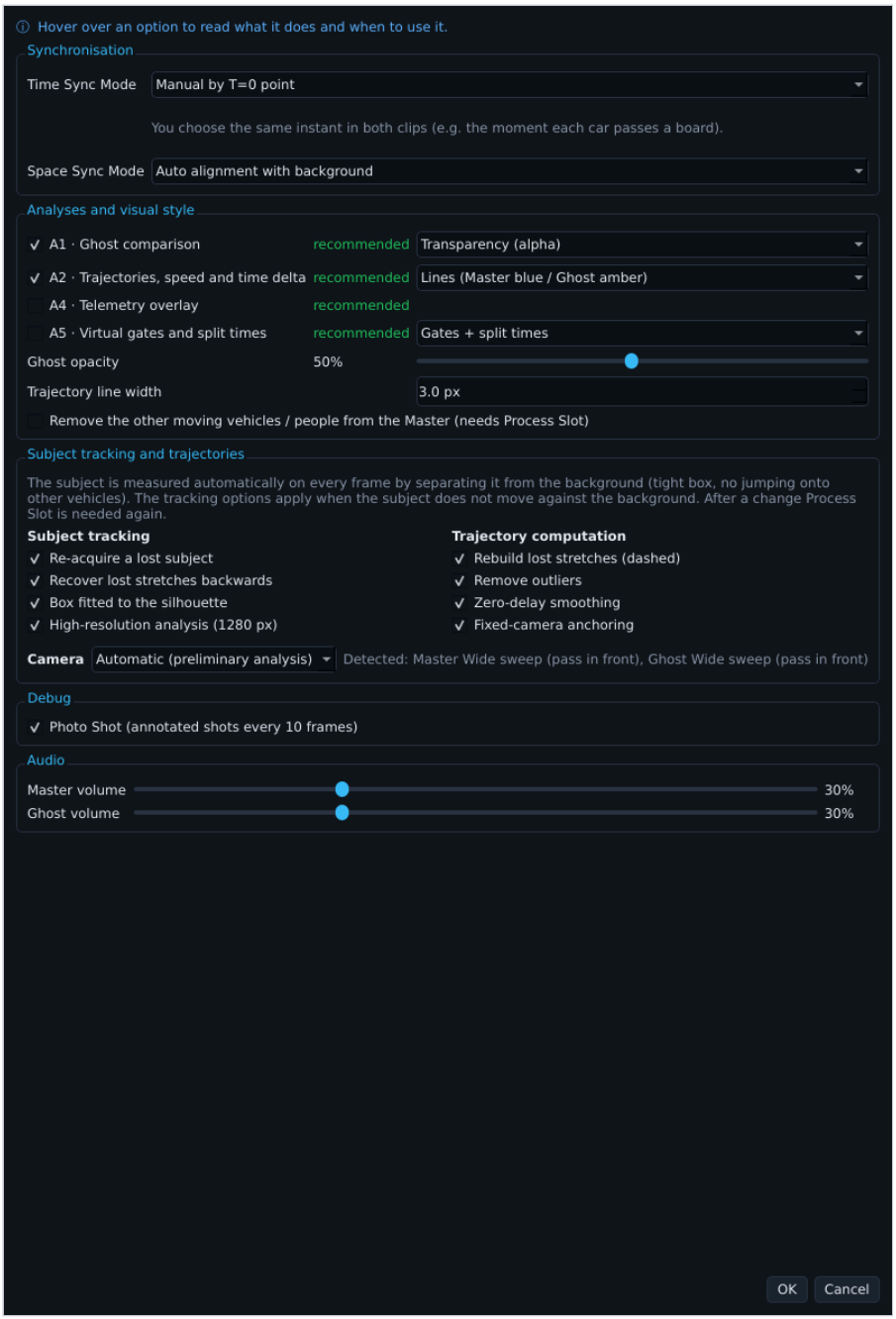


Figure 11 – The Slot Config window.

8.1 Analyses and visual style

Analysis	Styles
A1 Ghost comparison	Transparency, differential colour, Simulcam, side by side; adjustable opacity.
A2 Trajectories, speed and time delta	Lines Master blue / Ghost amber, colour by acceleration/braking, dots with minimum speed; line width.
A3 Body angles (Pro/Team)	Skeleton with joint angles, body axes only.
A4 Telemetry (Pro/Team)	Charts of the synchronised CSV channels.
A5 Virtual gates and split times	Gates + split times.

Next to each analysis it says whether it is *recommended* or *optional* for the chosen sport. The option **Remove the other moving vehicles / people from the Master** erases from the Master everything that moves except the subject.

8.2 Subject tracking and trajectories

Option	Effect
Re-acquire a lost subject	Searches the subject again where its motion takes it.
Recover lost stretches backwards	Tracks backwards the stretches lost and then found again.
Box fitted to the silhouette	Tightens the rectangle on the subject's silhouette.
High-resolution analysis	Works at 1280 px: for small, far subjects; slower.
Rebuild lost stretches	Rebuilds the lost stretches (drawn dashed).
Remove outliers	Discards inconsistent measurements.
Zero-delay smoothing	Smooths the line without making it lag.
Fixed-camera anchoring	With a fixed camera locks every frame to the first: no drift.

8.3 Camera

A **preliminary analysis** of the camera motion classifies each clip and picks the strategies:

Type	How it is recognised	Strategies
Fixed (tripod)	the picture never moves more than 4% of its width	keyframes locked to the first one
Smooth pan	regular motion, little shake	standard strategies
Handheld (smartphone)	the motion shakes from frame to frame	trajectory cleaned in nearby pictures, lost stretches rebuilt up to 1.5 s
Wide sweep	the picture travels more than 1.5 widths	as “handheld”, trail limited to the last 4 s

With **Automatic** the program uses the detected type, written next to the choice after Process Slot (*Detected: Master …, Ghost …*) and in the header of every Photo Shot picture. If it is wrong, choose the right type and process again.

8.4 Audio and debug

Master and Ghost volume are set per slot. **Photo Shot** saves annotated pictures during processing (chapter 15).

9 Processing and result

9.1 Process Slot

Process Slot (or **Video → Process All Slots**, `Ctrl` + `P`) measures the camera motion, tracks the subjects, aligns the Ghost on the Master and computes trajectories and times. Progress is shown on the slot; you can keep working meanwhile.

During processing the program recognises the **track ribbon** under the subject (asphalt, dirt or snow) and refines the alignment right there, where trajectories and Ghost live.

9.2 Preview and Final Cut

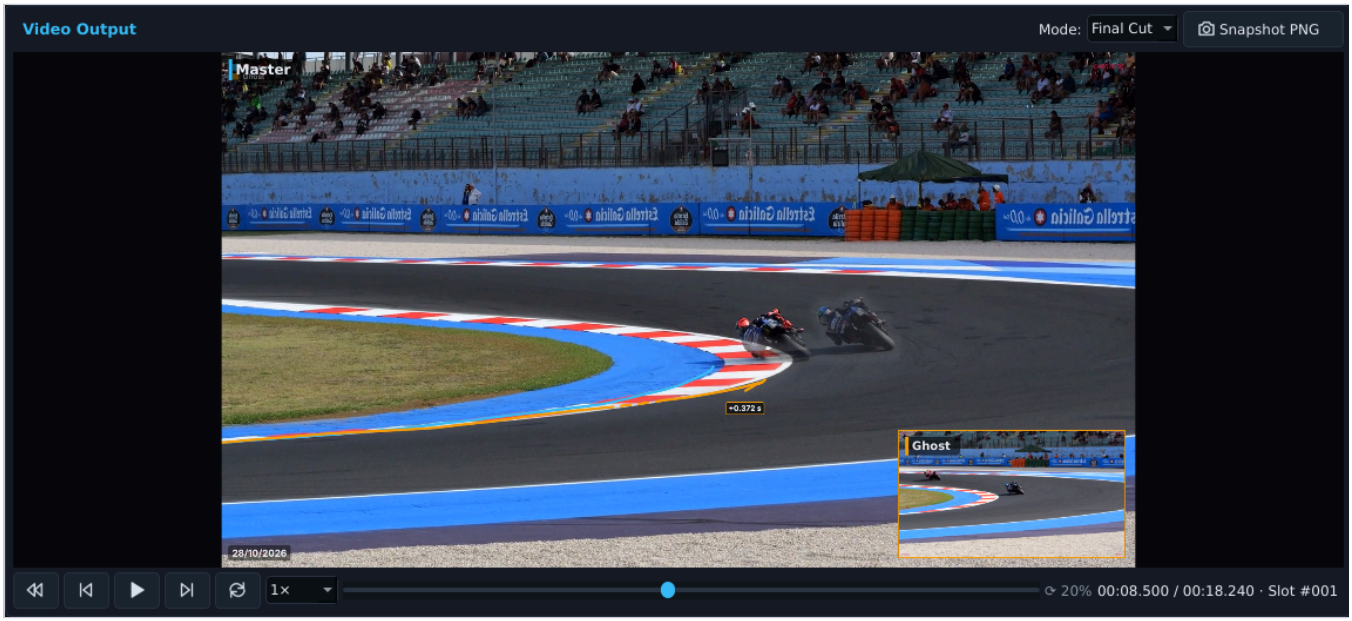


Figure 12 – The Video Output zone in Final Cut mode: Ghost, trajectories and time delta.

- **Preview**: fast preview to scroll and check.
- **Final Cut**: shows exactly the video that will be exported, frame by frame.
- The small inset shows the other channel: clicking it swaps them.
- Dragging on the picture zooms into an area; **Use this zoom in the exported video too…** adds it to the export.

9.3 Warnings

At the end warnings may appear such as *subject lost for part of the slot* or *partial alignment*: chapter 19 explains what to do.

10 Virtual gates and split times

Gates are lines drawn on the track in one Master frame. The program carries them onto the Ghost using the background and measures when each subject crosses them, with sub-frame precision.

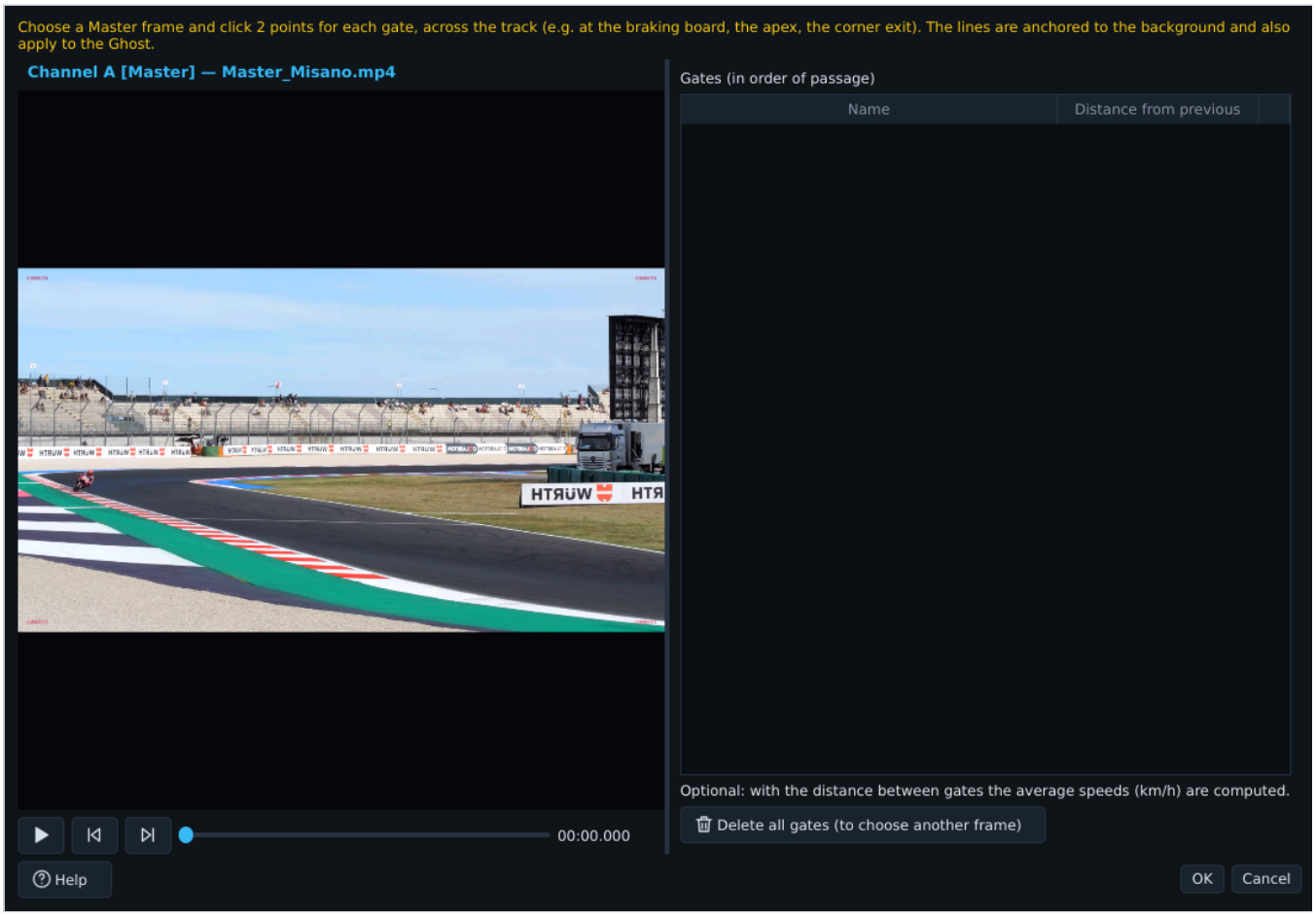


Figure 13 – The Virtual gates window.

1. Open **Virtual gates** from the slot and pick a frame with the track clearly visible.
2. Draw each gate across the track; give it a name and, if you wish, the distance from the previous one.
3. Process Slot: splits and deltas appear as overlays.
4. **Video → Export split times (CSV)…** saves the table of times.

> **Where to put gate 1**
>
> Where the subject is large and crosses the line sideways: the instant is measured more precisely.

11 Notes, zooms and audio

- **Freeze-frame notes** (Pro/Team): text over an interval of the slot, pausing the video to explain a point.
- **Zooms**: magnified areas over an interval, created from the output or from the slot's zoom row.
- **Audio**: Master and Ghost volume per slot; the export mixes the two tracks.

12 Telemetry

Available in the Pro and Team tiers. The program reads CSV files from AiM, MoTeC, VBOX and generic formats, recognises the channels and shows them in sync with the video.

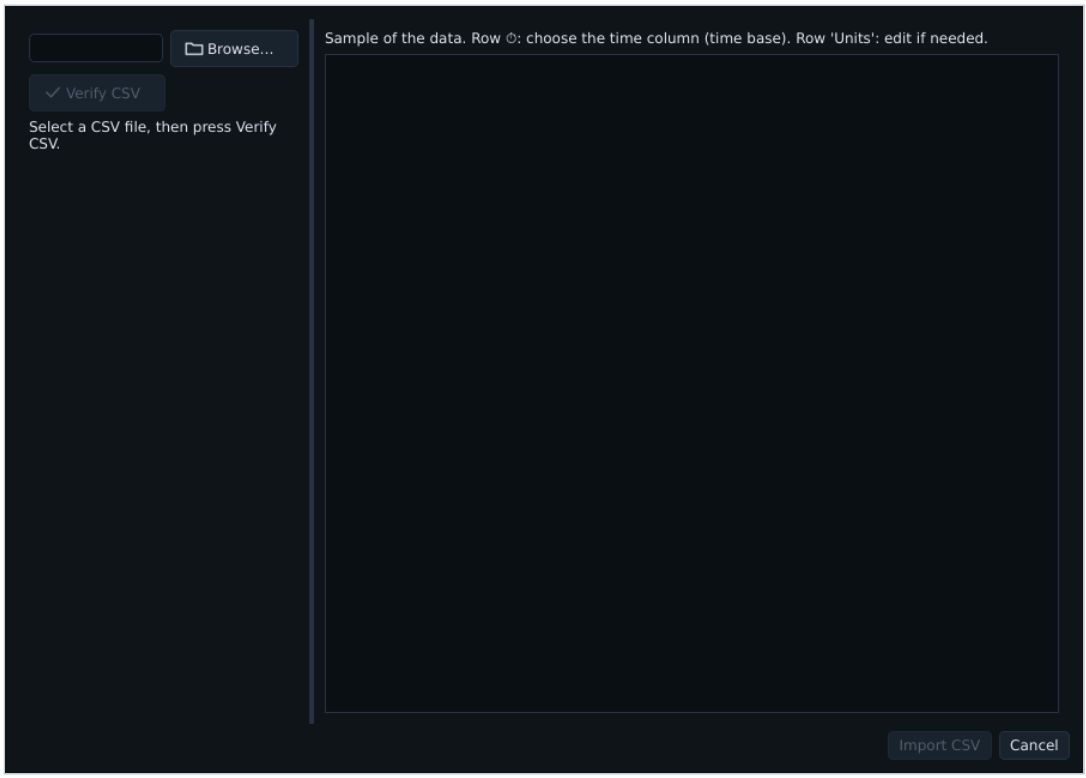


Figure 14 – The Add CSV window: checking the file structure.

1. **Telemetry → Add CSV**, choose the file and press **Verify CSV**.
2. Confirm with **Import CSV**: the file appears in the Telemetry Library.
3. Drag it onto the slot's **Telemetry CSV · A** (or B) row.
4. **CSV Config**: choose the channels and align the time with the offset.

13 Body angles (AI)

Available in the Pro and Team tiers. With the *A3 Body angles* analysis the program recognises the skeleton of the rider or athlete and computes the angles typical of the sport (e.g. for motorcycles: lean, body offset, head, elbows, knee). Master and Ghost values appear in a table over the video.

14 AI assistant

Available in the Pro and Team tiers. **AI → AI assistant…** (`Ctrl`+`Shift`+`A`) opens an assistant that knows the project: it checks slots and subjects, suggests the right options and applies them after confirmation, and can prepare processed copies of the clips (e.g. removing a fence in front of the camera) in the AI workspace folder.

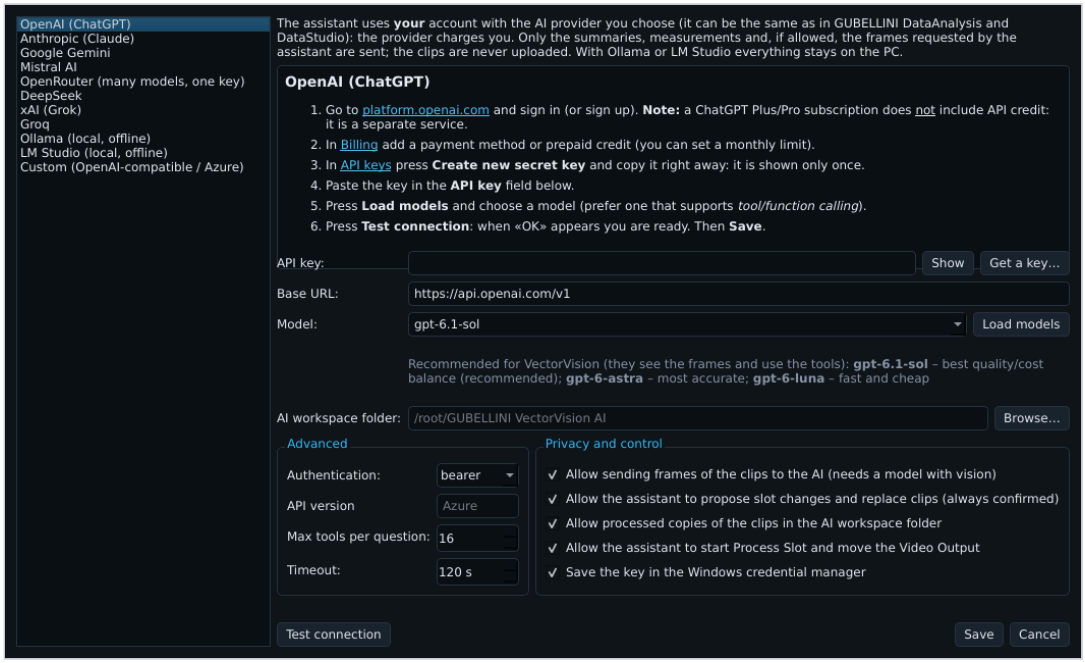


Figure 15 – The assistant setup: provider, model and key.

> **AI provider key**
>
> The assistant uses an API key of the user's own AI provider, entered in **AI → Configure AI…**; usage costs depend on the provider.

15 Photo Shot

With **Photo Shot** enabled in the slot configuration, Process Slot saves one picture every 10 frames with box, centroid, contact point, lean line, trajectory, gates and detected camera type. It is the quickest way to understand an unexpected result.



Figure 16 – The Photo Shot window with the annotated pictures.

It opens from **Video → Photo Shot (debug)…** or from the camera icon on the slot; the 3× loupe helps to check details.

16 Export

Video → Export Video… (`Ctrl`+`E`) creates the final video with the resolution, frame rate, quality and format of the Project Preferences. All slots must be green.

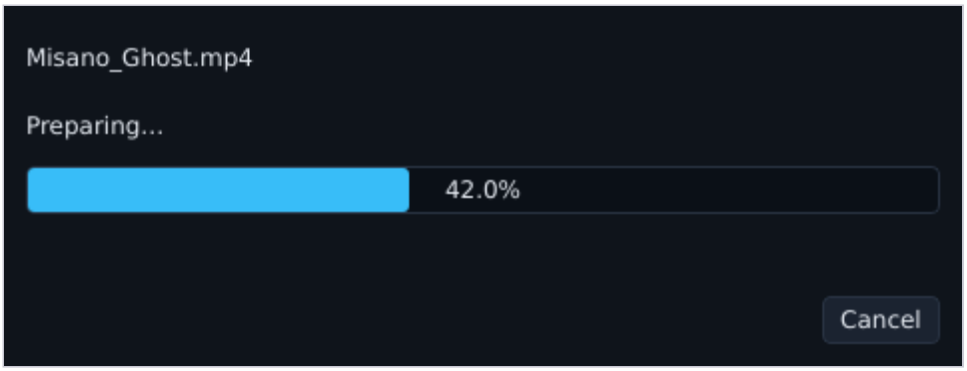


Figure 17 – Export in progress, in the background.

- Track: up to 1080p with a small VectorVision logo; Pro: no logo, maximum resolution; Team: with the customer's logo.
- **Snapshot PNG** (`Ctrl`+`Shift`+`P`) saves the current frame.

17 Preferences

File → Preferences… holds the program settings; the preferences of each project (sport, resolution, labels, logo, date) are in the Project Preferences zone.

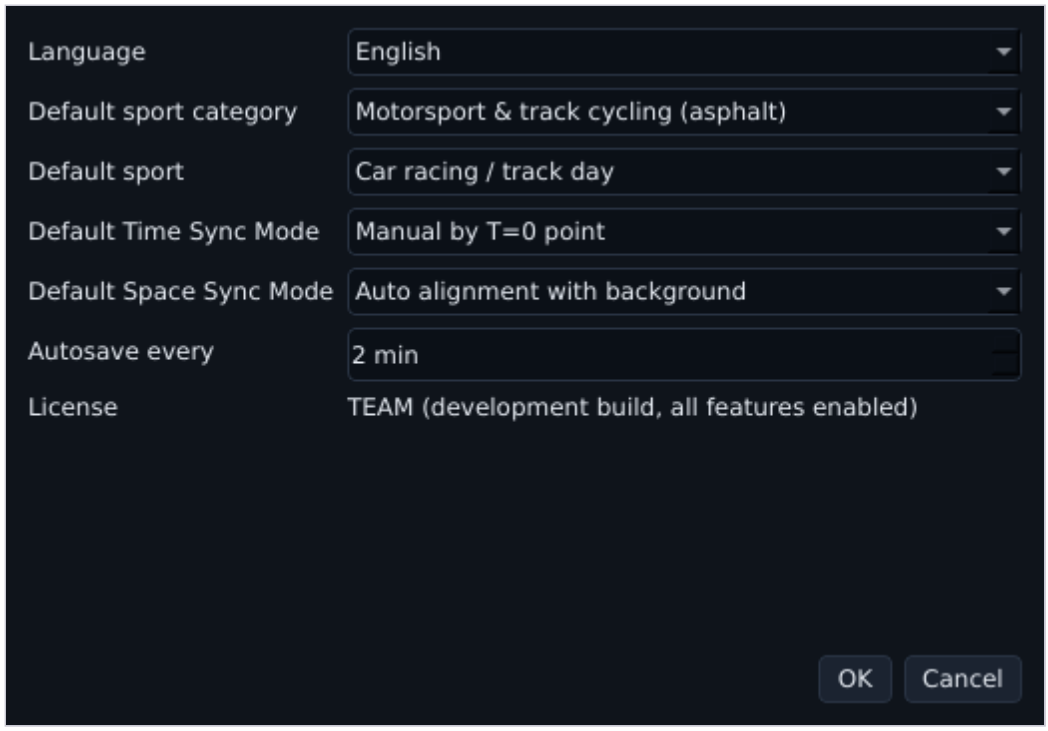


Figure 18 – The Preferences window.

Setting	Effect
Language	Interface language, applied at once.
Default category and sport	Used for new projects.
Default Time / Space Sync Mode	Used for new slots.
Autosave	Interval of the recovery save.
License	Active tier.

Available disciplines: motorcycle racing, karting, car racing, safe driving / riding schools, vehicle testing, motocross / supercross / enduro, downhill MTB / BMX, alpine skiing, snowboard, athletics jumps, equestrian.

18 Updates

Help → Check for Updates checks on the GUBELLINI server whether a newer revision exists; if so it downloads it (with an integrity check) and starts the installer. With **Check for updates at startup** the check is automatic; **Update server…** changes the address.

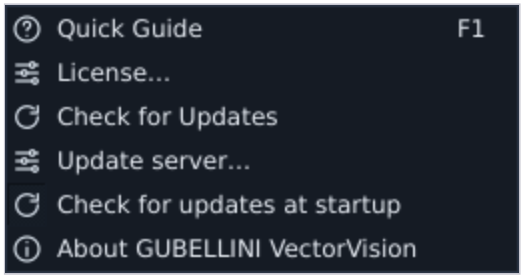


Figure 19 – The Help menu.



Figure 20 – About GUBELLINI VectorVision: revision, encoder and license.

19 Practical examples and troubleshooting

19.1 Examples

Two track laps compared (motorcycle)

Sport *Motorcycle racing*. Import the two videos shot from the same spot, Ghost on channel B, subjects selected where the bikes are sharp, Time Sync *Follow subject*, Process Slot. Result: overlaid Ghost, correct lean angle and contact point, live time delta into the braking zone.

Student vs instructor (riding school)

Sport *Safe driving / riding schools*. Fixed camera on a tripod, Time Sync *Gate 1* with a gate at the exercise entry: both passes start together and the gap is read at the end. The detected camera type should be “Fixed”.

Handheld smartphone footage

Any sport. Leave Camera on *Automatic*: with wide sweeps the program applies the dedicated strategies by itself (background from nearby frames, alignment in the pictures, trail limited to the last seconds).

19.2 Troubleshooting

Problem	Solution
Yellow slot	Something changed that requires Process Slot.
Subject lost for part of the slot	Select the subject where it is well apart from others; try the high-resolution analysis; check in Photo Shot where it gets lost.
Misaligned Ghost	Check the detected camera type; with a fixed camera try the 4 manual points on well spread ground points.
Odd gate times	Move gate 1 where the subject is large and crosses sideways.
Feature not available	Not included in the tier in use: see chapter 2.
Startup error	Read `%LOCALAPPDATA%\GUBELLINI VectorVision\error.log` and send it to support.

20 Shortcuts and support

20.1 Keyboard shortcuts

Keys	Action
`Space`	Play / Pause
`←` `→`	Previous / next frame
`Ctrl` + `N` / `O` / `S`	New / Open / Save project
`Ctrl` + `Shift` + `S`	Save project as
`Ctrl` + `I`	Add clip
`Ctrl` + `P`	Process All Slots
`Ctrl` + `E`	Export video
`Ctrl` + `Shift` + `P`	Snapshot PNG
`Ctrl` + `Z` / `Y`	Undo / Redo
`Ctrl` + `Shift` + `A`	AI assistant
`Ctrl` + `,`	Preferences
`F1`	Quick Guide
`F11`	Subjects window full screen

20.2 Support

Write to **info@gubellinielectronics.com** attaching the revision (**Help → About**), the `error.log` file and, if possible, two Photo Shot pictures of the problem. Pro and Team have priority; Team includes an online onboarding session.