

USER MANUAL

Introduction &
Requirements

Redundancy

Audio & AoIP Integration

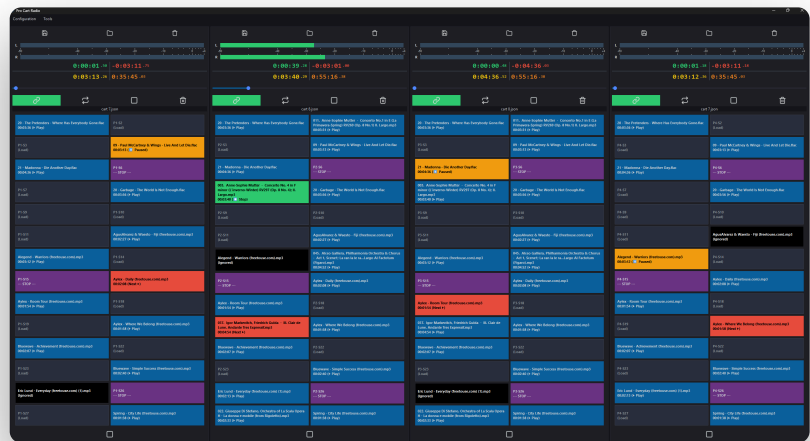
Inventory Management

Operation & Modes

External Control

Audit & Security

Pro Cart Radio is a high-availability playback engine for modern radio stations. Its design focuses on absolute stability and instant tactile response.



*Figure 1.1: Pro Cart Radio Main Interface —
VU monitoring, timers, and 4 independent master players*

SYSTEM REQUIREMENTS

COMPONENT	FUNCTIONAL REQUIREMENTS	BROADCAST REQUIREMENTS
Operating System	Windows 10 (64-bit)	Windows 10 / 11 Pro (64-bit) optimized*
Processor (CPU)	Intel Core i3 (8th Gen) or Ryzen 3	Intel Core i5 (10th Gen+) or Ryzen 5
RAM Memory	8 GB DDR4	16 GB DDR4 (or superior)
Storage	SSD SATA (256 GB)	SSD NVMe M.2 (512 GB or superior)

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TRIPLE-LEVEL REDUNDANCY

Pro Cart Radio uses a hierarchical database architecture to prevent silence due to infrastructure failures: **Main Database** (Server), **Mirror** (Network), and **Local Cache** (SSD). The system automatically falls back through each level if a path becomes unavailable.

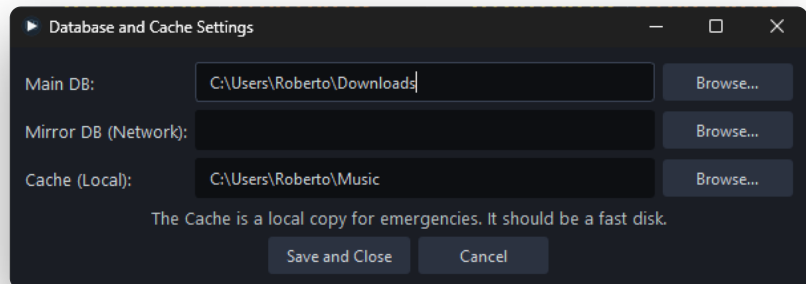


Figure 2.1: Database & Cache Settings — configure redundant paths for Main DB, Mirror, and Local Cache

AUDIO & AOIP INTEGRATION

The system allows for native multichannel audio delivery and is compatible with modern audio-over-IP infrastructures.

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Figure 3.1: Audio Output Configuration — assign an independent hardware output to each player

By using **Virtual Drivers (DVS)**, Pro Cart Radio communicates directly with the radio's IP network without the need for analog wiring, ensuring zero latency and perfect PTP synchronization between broadcast nodes and digital consoles.

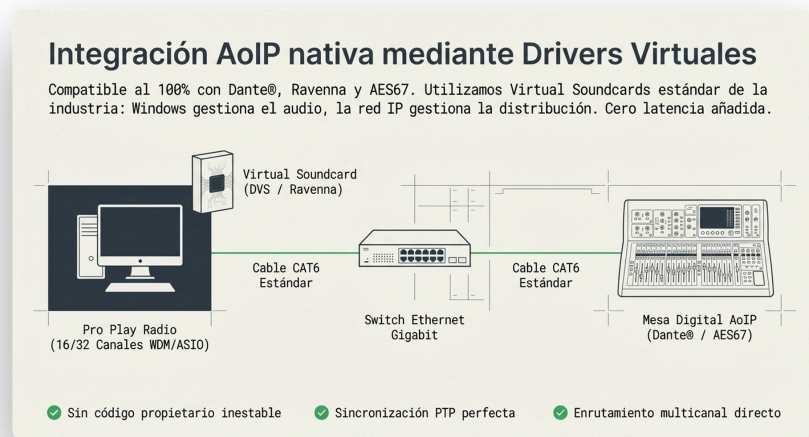


Figure 3.2: Integration with Dante, Ravenna, and AES67 protocols

INVENTORY MANAGEMENT & EXPLORER

The built-in file explorer allows operators to browse all configured database sources and load playlists or individual audio tracks directly into any player slot.

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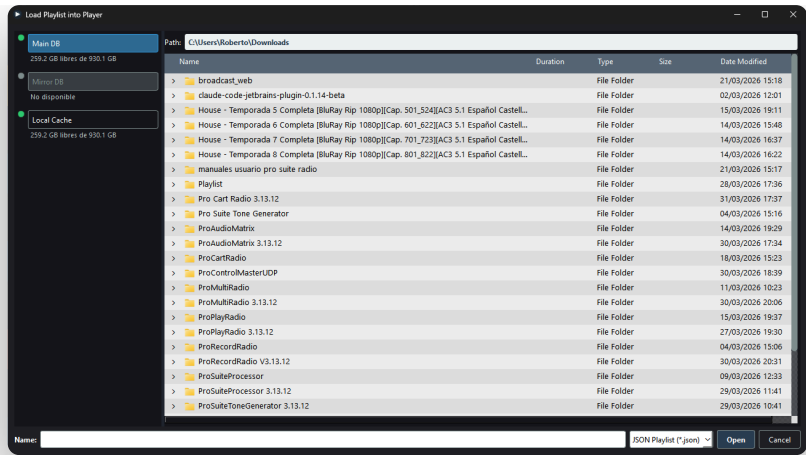


Figure 4.1: Load Playlist dialog — browse Main DB, Mirror DB, or Local Cache with real-time disk space display

- **Network Status:** LED indicators show the connectivity of each storage node (green = connected, grey = unset, red = unreachable).
- **Tag Reading:** The system pre-analyses audio files in real-time when browsing the local or network directory, showing duration and file type.
- **Dual Source:** Supports loading both individual audio tracks and full JSON playlists from a single dialog.

OPERATION & MODES

Each player holds up to **28 independent cart slots**. Every slot displays the track name, duration, and its current state using a colour-coded system that gives the operator an instant visual overview of the entire broadcast queue.

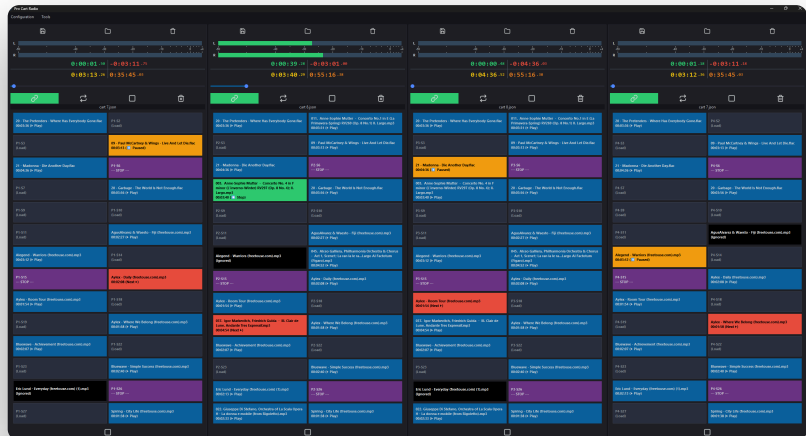


Figure 5.1: Live view of 4 players — slots showing all possible colour states simultaneously

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SLOT COLOUR REFERENCE

COLOUR	STATE	MEANING
<input type="checkbox"/> Dark grey	EMPTY	No audio file loaded. Click to open the file browser and load a track.
Blue	LOADED	Audio file loaded and ready to play. Click to start playback immediately.
Green	PLAYING	Track is currently on air. Click to pause.
Orange	PAUSED	Playback paused mid-track. Click to resume from the same position.
Red	CUED (Next >)	Pre-selected as the next track to play. Will trigger automatically when the active track ends (Stop-End mode), or can be started manually at any time.
Purple	STOP MARKER	Acts as a hard stop point in the sequence. When Auto-Next reaches this slot, playback halts. Used to mark the end of a scheduled block.
<input type="checkbox"/> Black	IGNORED	Track is loaded but excluded from Auto-Next sequencing. The slot is skipped automatically during unattended playback.

PLAYBACK MODES

Sequencing logic is controlled using the mode buttons located below the main VU meter on each player.

ICON	MODE	TECHNICAL DESCRIPTION
	AUTO-NEXT	Triggers the next available (non-ignored) track immediately as soon as the current one ends. Stops at any STOP MARKER slot.
	LOOP	Restarts the current track indefinitely until manually stopped or the mode is changed.

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EXTERNAL CONTROL

INSTANT FADER START (RS-232 / GPIO)

Physical control via standard COM ports. No complex proprietary hardware required — a USB-to-RS232 adapter is sufficient.

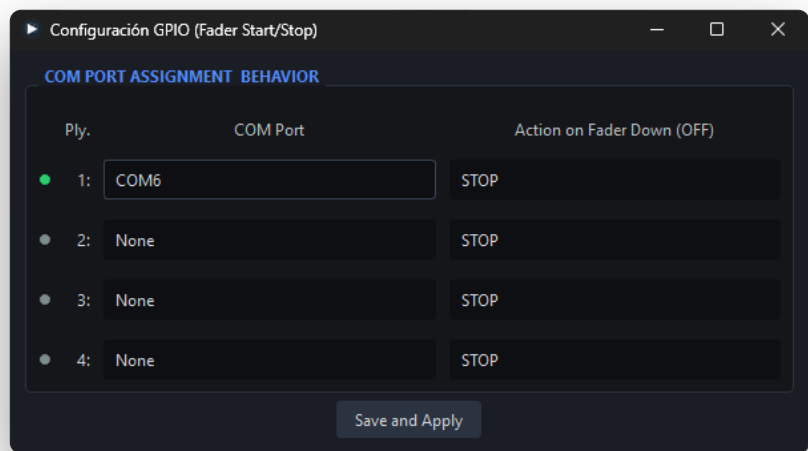


Figure 6.1: GPIO Configuration — assign a COM port and Fader Down action (STOP / PAUSE / IGNORE) to each player

ICON	MODE	TECHNICAL DESCRIPTION
	STOP-END	Stops upon completion and pre-cues the next track in red (Cued state), ready for the operator to trigger manually.
	DELETE AFTER PLAY	Removes the track from the slot immediately after broadcast ends. Useful for one-shot jingles or time-sensitive content.

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Fader Start instantáneo: Cero hardware propietario

Arranque los reproductores directamente desde su mesa de mezclas mediante adaptadores USB-RS232 estándar.

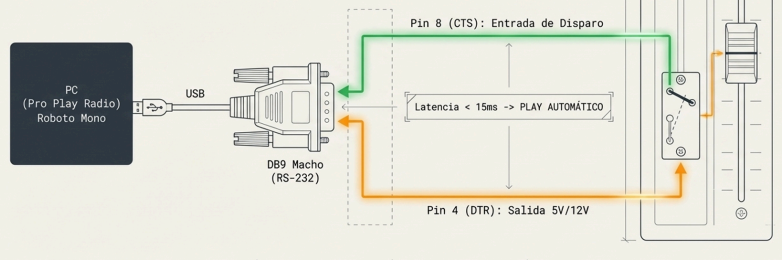


Figure 6.2: Hardware wiring diagram — Pin 8 (CTS) and Pin 4 (DTR)

Integration through USB-RS232 adapters allows the software to detect fader movement in less than 15ms, reliably activating **Automatic Play**. Each player can be assigned an independent COM port and a separate action for the Fader Down (OFF) event: STOP, PAUSE, or IGNORE.

IP SYNCHRONIZATION (UDP MATRIX / GPI-GPO)

The system acts as an intelligent UDP node, receiving play/stop commands from external consoles and sending real-time status feedback to activate **On Air Lights** and GPO relays.

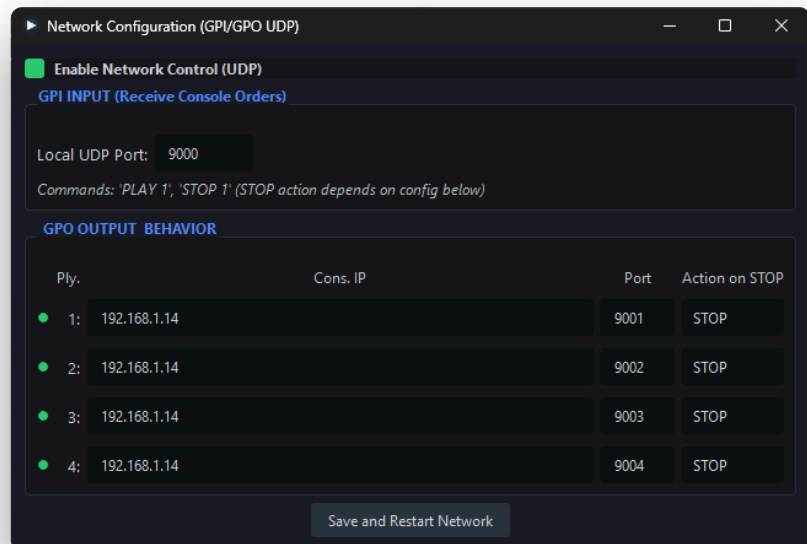


Figure 6.3: Network Configuration — GPI input port, console IP/port per player, and STOP action behaviour

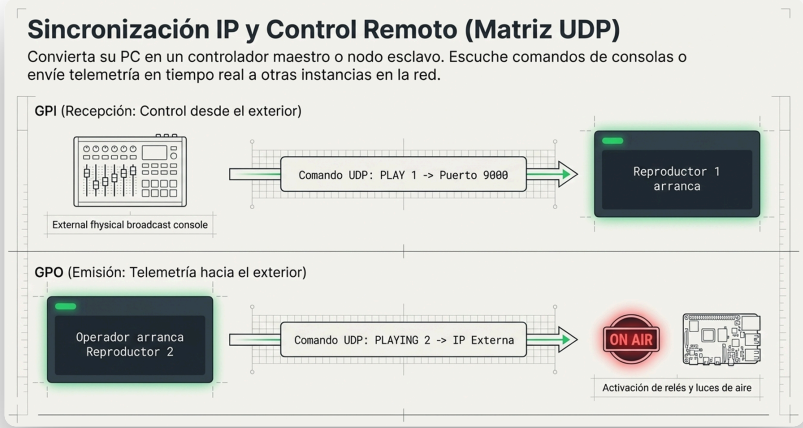


Figure 6.4: GPI/GPO messaging flow via Port 9000

Commands follow the simple format: PLAY 1, STOP 2. Each player can send feedback to a different console IP. The LED indicators show the real-time routing status for each player's network path.

AUDIT & SECURITY

Pro Cart Radio maintains a full, searchable log of all system events, providing broadcast-grade accountability for every action taken during on-air operation.

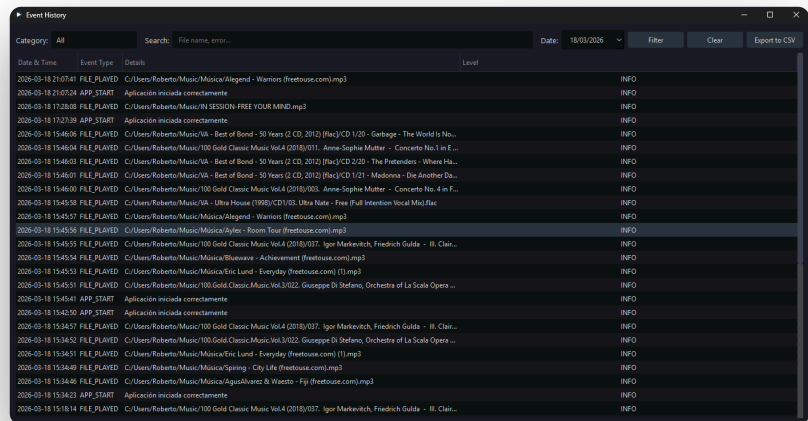


Figure 7.1: Event History — filterable log of all playback, system, and error events with CSV export

SECURE LICENSING (DONGLE)

Licenciamiento Seguro (Hardware Dongle)

Protección total de su inversión sin depender de costosas llaves propietarias.
El ejecutable se ancla criptográficamente al número de serie físico del hardware.

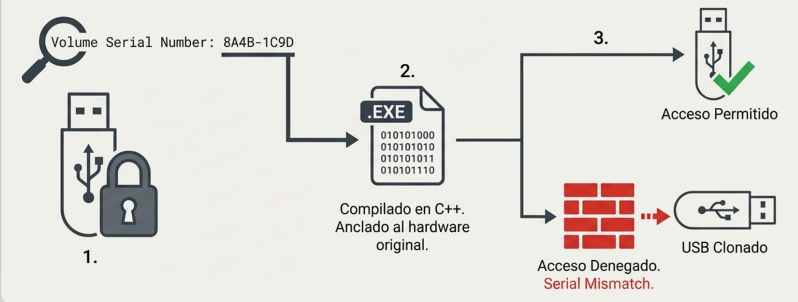


Figure 7.2: Protection system anchored to physical hardware serial number

To ensure software integrity and protect your investment, Pro Cart Radio uses a **Dongle Licensing** system. The executable is cryptographically anchored to the original hardware's physical serial number, preventing execution on unauthorized or cloned hosts.