



GTX 327 / 330 Transponder Replica

USER GUIDE

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1 Overview

The RHSimTech GTX 327/330 Transponder Replica is a panel-mounted replica of the Garmin GTX 327 and GTX 330 Mode-C/S transponders, designed for flight-simulator cockpit builders. The unit replicates the front-panel appearance, controls, and display behaviour of both instruments and communicates with your simulator host software over a high-speed serial link.

Transponder code, mode selection (STBY / ON / ALT), IDENT, and all display data are driven live from the simulator. The unit also provides a full suite of standalone timers and monitoring tools that operate independently of the host.

Key Features

- High-resolution OLED display replicating the GTX 327/330 layout
- Four-digit octal transponder code entry with visual cursor and CLR correction
- Mode buttons: OFF / STBY / ON / ALT / IDENT / VFR
- Pressure altitude readout with VSI trend arrows (climb/descend, slow/fast)
- Flight timer (airborne time tracked automatically)
- Count-up stopwatch and count-down timer with programmable set-time
- Flight ID display (read from simulator, 8 characters)
- Altitude monitor with ± 200 ft threshold alert and ABOVE/BELOW flash
- Adjustable day and night display contrast
- Configurable default power mode — powers on automatically with avionics, or stays off until manually selected
- Panel backlight brightness controlled directly from the simulator
- Avionics bus awareness — powers down when simulator avionics are off, restores when power returns

2 Getting Started

2.1 Connections

The unit has a single USB-C port on the rear panel. Connect this to your PC using a USB-C cable — it carries both data and power. You may connect directly to a USB port on your PC, or preferably through a powered USB hub.

2.2 Driver Installation

The unit presents as a standard USB serial device. On Windows 10/11 the driver installs automatically. If the port is not recognised, download and install the CP210x driver from rhsimtech.co.uk/downloads.php.

3 Front Panel Controls

3.1 Mode Selector Buttons

Button	Function
OFF	Hold for 2 seconds to power the transponder off. While powering down, the display shows HOLD TO POWER OFF. Release early to cancel.
STBY	Standby mode — transponder is on but not transmitting.
ON	Active mode — transponder replies to interrogations.
ALT	Altitude reporting mode — transponder replies with Mode-C altitude data.
IDENT	Transmits an IDENT pulse. The IDENT indicator is shown on the display while active.
VFR	Sets the transponder code to the VFR squawk configured for your region (1200 USA / 7000 UK+Europe). The active region is set in SimLink options or the X-Plane plugin settings.

3.2 Numeric Keypad

Keys 0–7 are used to enter transponder codes (octal, digits 0–7 only). Keys 8 and 9 are used on the DAY CONTRAST (page 7) and NIGHT CONTRAST (page 8) display pages to adjust brightness. Keys 0–9 are used for countdown timer entry on the COUNT DOWN display page.

3.3 Function and Navigation Keys

Key	Function
FUNC	Cycles the right-hand display through nine pages (see Section 5). Press repeatedly to advance.
CRSR	In transponder entry: cancels the current entry and restores the previous code. In COUNT DOWN: enters time-set mode.
CLR	In transponder entry: steps back one digit. Within the 5-second post-entry correction window: returns cursor to digit 4 for correction. In COUNT DOWN and COUNT UP (when stopped): resets the timer.
START/ STOP	Starts or pauses the active timer (COUNT UP, COUNT DOWN, FLIGHT TIME). In ALT MONITOR: activates or deactivates altitude monitoring. In DAY/NIGHT CONTRAST: toggles between day and night modes for adjustment.

3.4 Display Layout

The wide-format OLED display is divided into two zones:

- **Left zone** — the four-digit transponder code in large numerals, the current mode label (STBY / ON / ALT), an IDENT indicator, and the receive (R) indicator.
- **Right zone** — the currently selected display page (see Section 5).

4 Transponder Operation

4.1 Code Display

When the simulator is connected and the transponder is active, the four-digit transponder code is read directly from the simulator and displayed continuously. The code updates in real time as the simulator changes it (for example, when ATC assigns a new squawk).

4.2 Entering a Transponder Code

To enter a code manually, press any digit key (0–7). The display immediately enters entry mode, showing the first digit and a cursor for the second. Entry proceeds digit by digit:

1. Press a digit key (0–7) for each of the four positions in turn.
2. After the fourth digit is entered, the code is committed automatically and sent to the simulator.
3. A 5-second post-entry correction window opens. During this window, press **CLR** to step back to digit 4 for correction.
4. If no key is pressed within 5 seconds at any point during entry, the session times out and the previous code is restored.
5. Press **CRSR** at any time during entry to cancel and restore the previous code.
6. Press **CLR** during digits 2–4 to step back to the previous digit.

Octal digits only. The transponder keypad accepts digits 0–7. Keys 8 and 9 are reserved for contrast adjustment on the relevant display pages.

4.3 IDENT

Press **IDENT** while the transponder is active to transmit an identification pulse to the simulator. The IDENT label appears on the display. The IDENT state clears once the simulator acknowledges it.

4.4 VFR Squawk

Press **VFR** to set the squawk to the local VFR code. The unit supports two regions:

- **USA** — 1200
- **UK / Europe** — 7000

The active region is configured in SimLink options (MSFS) or in the X-Plane plugin settings. Pressing **VFR** sets the squawk to the configured code immediately.

4.5 Mode Synchronisation with the Simulator

The mode buttons (STBY / ON / ALT) update both the display and the simulator in real time. The simulator can also change the mode remotely (for example, when the virtual cockpit OFF button is selected). Mode changes from the simulator are applied only when the simulator value actually changes, so a button press on the physical unit is not overridden by simulator data.

4.6 Power and Avionics Bus

The unit tracks the simulator's avionics bus state:

- When avionics power is removed (bus goes to 0), the unit powers off and the display clears.
- When avionics power is restored, the unit either boots automatically or remains off, depending on the **Default Power Mode** setting (Section 5.6).
- While powered off, pressing STBY, ON, or ALT — provided avionics are live — powers the unit on in the selected mode.

5 Display Pages

The right-hand zone of the display cycles through nine pages using the **FUNC** key. The left-hand transponder zone is always visible regardless of the active page.

5.1 Page 1 — Pressure Altitude

Displays the current pressure altitude in feet as received from the simulator (five digits). VSI trend arrows appear to the right of the altitude readout:

- Single arrow up — climbing slowly
- Double arrow up — climbing fast
- Single arrow down — descending slowly
- Double arrow down — descending fast

If the Altitude Monitor (page 6) is active, a small MON reminder is shown.

5.2 Page 2 — Flight Time

Shows the current airborne time in **HH:MM:SS** format. Timing starts automatically when the simulator reports the aircraft as airborne (weight-off-wheels) and pauses on landing. Flight time accumulates across touch-and-go landings within a session.

5.3 Page 3 — Count Up

A free-running stopwatch. Press **START/STOP** to start or pause. Press **CLR** while paused to reset to zero. The timer continues running on other display pages.

5.4 Page 4 — Count Down

A countdown timer with programmable set-time (default 60:00). Press **START/STOP** to start or stop. Press **CLR** while stopped to reset to the programmed time.

Setting the Countdown Time

1. Ensure the timer is stopped and not in an expired state.
2. Press **CRSR** to enter time-set mode. The display shows **HH:MM:SS** with a cursor on the first digit.
3. Enter digits for hours (one digit), minutes (two digits), and seconds (two digits) in sequence.
4. The timer is committed automatically after the final digit. If no key is pressed within 5 seconds the entry times out without changing the set-time.

Countdown Expiry

When the countdown reaches zero, the display shows a flashing **EXPIRED** banner and begins counting up from the moment of expiry. Press **START/STOP** to clear the expired state and restore the programmed set-time.

5.5 Page 5 — Flight ID

Displays the 8-character Flight ID transmitted by the simulator (space-padded if shorter). This field is read-only; it is set by the host software from the flight plan or ATC callsign.

5.6 Page 6 — Altitude Monitor

Monitors deviation from a reference altitude. Press **START/STOP** to activate — the current pressure altitude is captured as the reference. Press **START/STOP** again to deactivate.

- While active, the display shows the current deviation in hundreds of feet.
- If deviation exceeds ± 200 ft, **ABOVE** or **BELOW** flashes on the display.
- The alert clears when the aircraft returns within 100 ft of the reference.
- The monitor deactivates automatically if deviation exceeds 1,200 ft (reference $\pm 1,000$ ft beyond the alert threshold).

5.7 Page 7 — Day Contrast

Adjusts the display brightness for day operation. Press key **9** to increase and key **8** to decrease. A progress bar shows the current level. Press **START/STOP** on this page to toggle between day and night preview so both levels can be set from the same page.

5.8 Page 8 — Night Contrast

Adjusts the display brightness for night operation. Controls are the same as page 7. The background inverts to black to represent the night appearance of the display.

Brightness and contrast notes

Day and night contrast are set locally and stored in the unit. The backlight brightness is controlled separately by the simulator via the plugin and tracks your simulator's instrument lighting bus — it cannot be set manually.

5.9 Page 9 — Default Power Mode

Sets what the unit does when the simulator plugin connects or when avionics power is restored after a loss:

Setting	Behaviour
ON (default)	The unit boots automatically in the mode commanded by the simulator (or ON if none is specified).
OFF	The unit remains off until a mode button (STBY / ON / ALT) is pressed, or until the simulator commands a mode change.

Press **START/STOP** on this page to toggle between OFF and ON. The setting is saved to non-volatile memory immediately and survives power cycles.

6 Simulator Integration

The GTX 327/330 Replica connects to your simulator via the RHSimTech plugin for your platform. All communication between the unit and the simulator is handled automatically by the plugin — no manual configuration of ports or protocols is required.

6.1 Microsoft Flight Simulator (MSFS 2020 / 2024)

1. Download **SimLink** from rhsimtech.co.uk/downloads.php. SimLink is a standalone application — no installer is required. Create a dedicated folder somewhere easy to find (for example `C:\RHSimTech\SimLink\`) and place the downloaded `.exe` there. The filename includes the version number (e.g. `SimLink v1.23.exe`) and will change with each release — the file inside the folder is always the one to run.
2. Connect the USB-C port on the rear of the unit to your PC — directly or through a powered USB hub.
3. Run the SimLink `.exe`. The GTX 327/330 is detected automatically.
4. Start MSFS and load a flight. SimLink will begin forwarding transponder data to the unit automatically. The transponder code, mode, altitude, and backlight all update in real time.

6.2 X-Plane 11 / 12

1. Download the **RHSimTech X-Plane Plugin** installer from rhsimtech.co.uk/downloads.php and run it. The installer places the plugin into your X-Plane plugins folder automatically.
2. Connect the USB-C port on the rear of the unit to your PC — directly or through a powered USB hub.
3. Launch X-Plane. The plugin detects the GTX 327/330 automatically and begins forwarding data.

7 Backlight & Brightness

The panel backlight brightness is controlled entirely by the simulator via the RHSimTech plugin. It maps directly to the simulator's instrument lighting bus, so it dims and brightens in step with your cockpit lighting rheostat. The backlight cannot be adjusted manually.

The OLED display contrast (the brightness of the display content itself) is set independently via pages 7 and 8 and stored in the unit. Day and night contrast levels are switched automatically based on the day/night state reported by the simulator via the plugin.

8 Troubleshooting

Symptom	Likely cause	Action
Display shows splash screens then goes blank; no response to simulator	Plugin not running or not connected	Ensure SimLink (MSFS) or the RHSimTech X-Plane plugin is running and the correct COM port is selected
Unit powers on but transponder code shows 9999	Plugin connected but no flight loaded	Load a flight in the simulator; the code updates automatically once the plugin starts sending data
Backlight is very dim or off	USB-C not connected, or simulator instrument lighting at zero	Check the USB-C connection to the PC; check the simulator's instrument lighting setting
Buttons respond but mode does not change in simulator	Plugin not receiving button output	Check the COM port selection in SimLink or the X-Plane plugin; try restarting the plugin
Stuck-button messages appear at startup	A button is physically held down during power-on	Release all buttons before applying power; check for debris under keycaps
Unit does not power on when simulator starts	Default Power Mode is set to OFF	Press STBY, ON, or ALT to power on manually, or change the setting on page 9
Countdown timer misses a digit entry	Key held too briefly	Press each key with a deliberate press and release; holding a key does not repeat

Unit not detected on USB

Cable or port issue

Try a different USB-C cable and a different USB port on the PC; confirm the COM port appears in Windows Device Manager under Ports (COM & LPT)

Factory reset

To reset the Default Power Mode to the factory default (ON), navigate to page 9 and press START/STOP until the ON option is selected. The setting is saved immediately. All other display contrast settings can be reset by adjusting back to the desired level on pages 7 and 8.

