Talko troubleshooting guide

Talko 2 — QC Hardware Test Mode

The Talko 2 Quality Control (QC) firmware is a special test mode that helps you
check the hardware of your module (pots, buttons, gate input, audio output, display, etc.).
It is very useful to diagnose problems after assembly and to report clear test
results when you ask for help.

When to Use the QC Firmware

- After building a Talko 2 kit, to confirm all controls and I/O work correctly.
- When you suspect a hardware issue (no sound, strange encoder behavior, bad pot, etc.).
- Before contacting support, so you can describe exactly which tests passed or failed.

Installing the QC Firmware on the Pico

The QC firmware is installed on the Raspberry Pi Pico in the same way as the main firmware,
using a UF2 file.

1. Make sure the Talko 2 is not powered.
2. Connect the Pico to your computer with a USB-C data cable.
   This will power the board and provide the data connection.
3. Press and hold the **BOOTSEL** button on the Pico.
4. While still holding **BOOTSEL**, briefly press and release the
   RESET button.

5. Keep holding **BOOTSEL** until a new drive named **RPI-RP2** appears on your computer.
6. Drag and drop the QC UF2 file onto the **RPI-RP2** drive.
7. After the copy finishes, the Pico will reboot automatically and start in QC mode.

To go back to the normal Talko 2 firmware later, simply repeat the same procedure
with the standard Talko 2 UF2 file.

Talko QC test

1 file(s) 215.00 KB
Download

How QC Mode Works

- The 7-segment display shows the currently selected *bank* (0–9, A).
- Each bank is a different hardware test.
- When the decimal point is **off**, you are in *bank selection mode*.
- When the decimal point is **on**, you are in *test mode*.

Navigation

Bank Selection Mode (default)

- Turn the rotary encoder to select a bank (0–9, A).
- The display shows the bank number, decimal point off.
- Press the encoder button to enter the selected test.

Test Mode

- The display shows the live test result, decimal point on.
- Press the encoder button again to exit and return to bank selection.
- The rotary encoder is disabled during tests (to avoid accidental bank changes),
  except in the brightness test (Bank A) where it is used to adjust brightness.

Bank Tests

Bank 0 — Sound Pot

- What it tests: Sound potentiometer.
- Display: Value from 0 to 9 according to pot position.
- How to use: Enter test mode, turn the sound pot and check that the value runs smoothly from 0 to 9.

Bank 1 — Speed Pot

- What it tests: Speed potentiometer.
- Display: 0–9 based on pot position.
- How to use: Enter test mode and turn the speed pot. The value should move smoothly from 0 to 9.

Bank 2 — Pitch Pot

- What it tests: Pitch potentiometer.
- Display: 0–9 based on pot position.
- How to use: Enter test mode, turn the pitch pot and confirm the full range 0–9.

Bank 3 — FX Pot

- What it tests: FX (effects) potentiometer.
- Display: 0–9 based on pot position.
- How to use: Enter test mode and turn the FX pot. The

display should cover 0–9.

Bank 4 – Gate Pin

- What it tests: Gate input.
- Display:
  - 0 = Gate pin low (grounded / pressed)
  - 1 = Gate pin high (idle)
- How to use: Enter test mode, toggle the gate input (button or external gate) and check that the display changes between 0 and 1.

Bank 5 – Error / Glitch Button

- What it tests: Error / glitch push button.
- Display:
  - 0 = Button not pressed (high)
  - 1 = Button pressed (low, active low)
- How to use: Enter test mode and press/release the error button. The display should toggle between 0 and 1.

Bank 6 – Mode Switch

- What it tests: Mode pins A and B (3-position toggle switch).
- Display:
  - 0 = Switch position 1 (Pin A low, Pin B high)
  - 1 = Middle position (both high)
  - 2 = Switch position 3 (Pin A high, Pin B low)
- How to use: Enter test mode and move the mode switch through all three positions. The display should show 0, 1 and 2.

Bank 7 – Test Tone (1000 Hz Sine)

- What it tests: Audio output with a clean 1000 Hz sine wave.
- Display: 7 with decimal point on.
- How to use: Enter test mode. The tone starts

automatically. Use this for audio level measurements or to check that the output is clean. Press the encoder to stop and exit.

Bank 8 — Speech Test

- What it tests: Speech synthesis engine (same code as production Bank 0 — numbers).
- Display: 8 with decimal point on.
- Controls:
    - Sound pot: Selects number 0–9.
    - Gate input: Triggers speaking the selected number.
    - Speed pot: Controls speech speed.
    - Pitch pot: Controls speech pitch.
- How to use: Enter test mode, choose a number with the sound pot and trigger it with the gate. Check that speed and pitch respond correctly.

Bank 9 — Sawtooth Test (1000 Hz)

- What it tests: Audio output with a 1000 Hz sawtooth waveform.
- Display: 9 with decimal point on.
- How to use: Enter test mode. A sawtooth tone (0–624 PWM range) starts automatically. Use it for waveform and level checks. Press the encoder to stop and exit.

Bank A — Display Brightness

- What it tests: Display brightness adjustment.
- Display: The number 8 blinking at 500 ms intervals.
- Controls:
    - Rotary encoder: Adjusts brightness (10–255, step of 5).
    - Encoder button: Saves the brightness to flash and exits the test.
- How to use: Enter test mode, turn the encoder until the brightness looks good, then press the encoder to store the value. The setting persists after power-off.

Quick Reference Table

Bank	Test	Display Range	Main Control
0	Sound Pot	0–9	Sound pot
1	Speed Pot	0–9	Speed pot
2	Pitch Pot	0–9	Pitch pot
3	FX Pot	0–9	FX pot
4	Gate Pin	0–1	Gate input
5	Error Button	0–1	Error / glitch button
6	Mode Pins	0–2	3-position mode switch
7	Test Tone	7	Auto-start (sine)
8	Speech	8	Gate + pots
9	Sawtooth	9	Auto-start (saw)
A	Brightness	8 (blinking)	Rotary encoder

Display Indicators

- Decimal point off: Bank selection mode.
- Decimal point on: Test mode active.
- Number on display: Bank number (selection mode) or live test value (test mode).

Idle Mode

If there is no activity for about 5 minutes, the display enters an idle mode with a slow breathing/glowing effect.
Any interaction (turning the encoder, pressing the encoder, or using the gate input) wakes the module and returns to bank selection mode.

Reporting Your Results for Support on

Discord

When you contact support, please include the results of the QC tests. This helps to diagnose issues much faster.
You can use this checklist:

- Confirm that Banks 0–3 (pots) reach their full ranges (0 and 9).
- Describe what you see in Banks 4–6 when you toggle the gate, error button and mode switch.
- Tell whether you hear sound in Banks 7 and 9 (tone and sawtooth) .
- Describe the behavior of the speech test (Bank 8): does it speak all numbers, does speed/pitch respond?
- Confirm that you can change brightness in Bank A.
- Add clear photos of the front and back of the module if you suspect a soldering or wiring issue.