



Mechanical Tally Counter 5.0



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[VIEW IN BROWSER](#)

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Summary

A mechanical tally counter, able to count from 0 to 99



5.56 hrs



5 pcs



0.20 mm



0.40 mm



PLA



50 g



Prusa
MK3/S/S+

[Learning](#) > [Engineering](#)

Tags: [assembly](#) [button](#) [clicker](#) [count](#) [counter](#) [door](#)
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READ BEFORE PRINTING!

This is a non-commercial print, this means you are not allowed to sell files or prints of this model.

What is this?

This is my fifth attempt on creating a mechanical tally counter.

It's adjusted so anyone with a reasonably dialed in (FDM)3D-printer will be able to print it. There are some non-printable parts but they should be easy to find at home, in any hardware store or as in my case, the grocery store.

I said earlier that I wouldn't continue developing this project... I was wrong. I found far too many ways to improve on the v.4 design to ignore it. Version 5 is based on the v.4 mechanism, but a lot more compact and easier to assemble, as seen in the pictures.

The key added in this project is also works for version 4!

Videos and assembly instructions:

A PDF assembly-instruction can be found among the download files. The key works both as a tool to screw together/apart the case, as well as a crank to reset the dial to any number.

Assembly instructions and demo (Animation):

How to use the counter:

Print Instructions

- Print all components in the **default orientation** to minimize support and maximize part strength.
- **Don't use raft**, Rafts tend to give the bottom surface a rough surface finish. It can mess up the tolerances, which will/can make the mechanism "sticky".
If I have problems with bed adhesion, I always use a brim! Just make sure the brim is entirely removed.
- **Support materials are only required on "second-digit-dial"**, I wouldn't recommend using support materials on any other part, especially not the Back Case. It shouldn't be necessary as all other parts are designed with either "bridges" or a 45 degree overhang.
- "first-digit-dial" and "second-digit-dial" are designed to be layered with two different filament colors, it isn't required but it makes the digits "pop" a lot more. The same goes for "Left-Button", "Right-Button" and "Front-Cover". See the pictures and videos for inspiration.

- Make sure to break loose the screw on the "back-cover" before assembly. This part can partially fuse with the rest of the back-cover.
 - **Clean all printed parts** from brims, support material, uneven surfaces etc! The tolerances in this project are quite lenient, but major flaws might still make the mechanism "sticky".
-

PART LIST (BOM)

PRINTED PARTS:

- **1x** left-button
- **1x** right-button
- **1x** left-button-arm
- **1x** right-button-arm
- **1x** front-cover
- **1x** back-cover
- **1x** ratchet-wheel
- **1x** ratchet-wheel-cap
- **1x** pin
- **1x** 4-tooth-partial-gear
- **1x** gear-lock-ring
- **1x** first-digit-gear
- **1x** second-digit-dial
- **1x** first-digit-dial
- **1x** key

NON-PRINTED PARTS:

- **3x** The tip spring of a pen (one for each button and one for the pin).
 - **1x** Small rubber band(approx. 120-140mm long), this rubber band should be small enough to be in tension when hooked on the button arms. However, a too short rubber band might not allow the arms to fold properly. It should be possible to cut a longer rubber band and tie the ends together to adjust the length, although, I haven't tried it.
-

Troubleshooting:

Heres a list of problems and some possible solutions. If your problem isn't in the list please let me know what the problem is so I (depending on the problem) can add it.

- **Problem:** My buttons stick when I press them down.

1. Clean your prints from any brims etc. No movable parts should have any significant friction.
2. The pen springs you used might be too weak.
3. Loosen the screw on the back of the back case, you might have over tightened it.

- **Problem:** My buttons are loose.

1. The pen springs you used are too short, they should be over 23 mm long in order to be slightly pre-tensioned.

- **Problem:** The Dials move but doesnt align with the window on the front case.

1. Make sure you followed the dial assembly step correctly.
2. Clean your prints from any brims etc loosen the screw, and make sure all parts are pushed together correctly.
3. The pin spring is too weak, try swapping it with another spring or a longer spring piece.

- **Problem:** The first digit dial turns when I press down the button, but turns back again when I release the button.

1. The rubber band is way too strong. The ratchet arms doesn't fold on their way back, which means the pin slips. Change to a rubber band which is barely in tension when assembled.

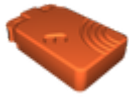
- **Problem:** The mechanism is sticky specifically when the second digit dial is supposed to turn. (e.g. from 19 to 20).

1. The 4 Tooth Partial Gear and Gear Lock Ring isn't pushed all the way down. The lock ring is supposed to be flush with the end of the gear axis, and the gear shouldn't be too loose while still being able to spin.

Updates:

- 2022-09-02: “**Front cover (without pattern)**” **added** due to some people having issues with the pattern shifting or bad bed adhesion.

Model files



previewfile-not-for-printing.stl

☐ Do not print this file, it's meant for the 3D-viewer.



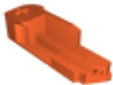
4-tooth-partial-gear.stl



second-digit-dial.stl



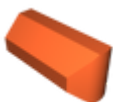
gear-lock-ring.stl



right-button.stl



left-button.stl



pin.stl



left-button-arm.stl



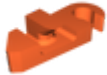
first-digit-gear.stl



first-digit-dial.stl



front-cover.stl



right-button-arm.stl



key.stl



ratchet-wheel-cap.stl



back-cover.stl



ratchet-wheel.stl



front-cover-without-pattern-v2.3mf

Print files



first-digit-dial-with-color-change.gcode

🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 0.20 hrs ⚖️ 10 g 🖨️ Prusa MK3/S/S+



buttons-with-color-change.gcode

🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 0.96 hrs ⚖️ 10 g 🖨️ Prusa MK3/S/S+



back-cover-and-front-cover-with-color-change.gcode

🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 2.74 hrs ⚖️ 10 g 🖨️ Prusa MK3/S/S+



the-rest-of-the-components.gcode

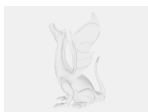
🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 1.13 hrs ⚖️ 10 g 🖨️ Prusa MK3/S/S+



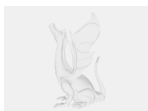
second-digit-dial-with-color-change.gcode

🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 0.53 hrs ⚖️ 10 g 🖨️ Prusa MK3/S/S+

Other files



assembly_instructions.pdf



link-to-assembly-video.txt

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