

Spool holder (1kg or 2kg) for Original Prusa Enclosure - Configurable



Chris Hill

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Summary

A spool holder with an extendable spindle, and 2 spindle locations, to suit 1kg or 2kg spools in any corner.

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This is a spool holder designed to mount inside the Original Prusa Enclosure. It has a spindle that screws to the main bracket, so that an extension piece (or a longer spindle) can be screwed in when you want to use a 2kg spool. To accommodate higher capacity spools that use a larger diameter instead of (or as well as) increased width, there are two spindle mounting points on the main bracket.

I was inspired by [this model](#) by Brolin Workshop, which I was using. My model is a complete re-modelling based on that concept. I found that on the odd occasion when I have needed to remove my printer from the enclosure, the long fixed spindle of Brolin Workshop's model makes that a little more difficult, so my model uses a removable spindle. Like Brolin Workshop's model, my model also makes use of a third screw hole in the frame of the enclosure to support the extra weight of a full 2kg spool (you'll need to remove a plastic rivet, and you'll need an additional M3 screw and nut - you should have received spares with the enclosure).

With the Version 3 update, there are now STLs that can be used in any corner of the enclosure.

Update 22 April 2024 - Version 3.1 Brackets

N.B. the V3 brackets, uploaded on 17th April 2024, flexed more than I intended when fully loaded with 2kg. I have therefore back-tracked a little on the weight loss - the outer frame has reverted to 8mm, and the hexagonal mesh is a little thicker and deeper than the V3 versions, although it is still less thick and less deep than the first versions. The V3 versions are still available in their own folder, and in fact if you simply want a fast printing 1kg bracket for the top or bottom corners, then the V3 versions are a good choice

I bought an MMU3 to go with my printer, and I wanted the option of mounting multiple spools inside the enclosure. So I've taken the opportunity to update the design of my spool holder.

I've found that five spools will fit in the enclosure quite nicely, if I place spool holders in each of the four front corners of the enclosure (with a double spool holder in the front-top-right corner). The two on the left side of the enclosure cause some blocking of the light from the LED strip, but I find that there is still enough illumination inside the enclosure. However, a spool holder in the back-top-left corner of the enclosure is also possible if you don't want to block the LED, and if you don't have the filtration system then the back-top-right corner can also be used.

So here's what's new with these brackets:

- A mirrored bracket that can be used in the 'opposite' corner(s). The original bracket was designed to fit in the front-top-right corner. This will also work in any corner that is diagonally opposite, across an enclosure face, from the front-top-right, i.e. front-bottom-left, back-top-left. The mirrored version can be used in the remaining corners, i.e. front-top-left, front-bottom-right or back-top-right. Note that the mirrored version isn't literally mirrored, e.g. as you could do in the slicer, because that would reverse the threads. It is geometrically mirrored, but with conventional screw threads.
- The brackets have been on a weight loss programme. The original bracket was deliberately chunky in order to be able to cope with 2kg spools, but I've found that it can be slimmed down considerably without compromising the strength. So the hexagonal mesh is now more slender and less deep, and the spindle mounting points are slimmed down but have some additional reinforcement to compensate. These changes mean that the brackets use less filament and print more quickly. Provided they are printed with appropriate settings they are strong enough to cope with 2kg - **I prefer 0.3mm**

layer height (for speed), 5 top and bottom layers, 4 perimeters, 40% cubic infill.

- The location of the spare spindle, in the top corner of the enclosure, has been adjusted so that it avoids the screw in the enclosure frame, meaning that the spare spindle can be screwed fully home. This is not only useful for storing spare spindles, it can be used to relocate the main spindle when the spool holder isn't in use, e.g. if the front-bottom-left spool holder isn't being used, the spindle can be stowed out of the way. In fact, when the bracket is used in the bottom corners, the 'spare' spindle location should be seen more as a 'stowage' position, since if there is a spool on the main spindle it will rub slightly on a spare spindle.
- The nut slots have been tweaked so that the nuts will push in and stay in, provided the extrusion multiplier for your filament is about right.
- The position of the second spindle has been adjusted so that it can more easily fit larger diameter spools.

The new brackets are in the folder 'Version 3.1 brackets - 22 April 2024'. There are 12 STLs, as follows:

- Three basic geometries:
 - 2 screw holes, 1 spindle location. This geometry is suitable for a single 1kg spool
 - 3 screw holes, 1 spindle location. The extra mounting screw means this version can be used with more weight, so would be suitable for 2x1kg spools or a 2kg spool if it has the same diameter as a 1kg spool.
 - 3 screw holes, 2 spindle locations. The extra spindle location suits a spool with a larger diameter.
- With and without the mount for the spare spindle. Each of the above geometries is available with both options.
- All of the above are provided for the original and the mirrored geometries. These are denoted as FTR or FTL (for front-top-right and front-top-left). To use in the other corners, choose the STL that is diagonally opposite across an enclosure face, e.g. the FTR can also be used in the FBL, etc.

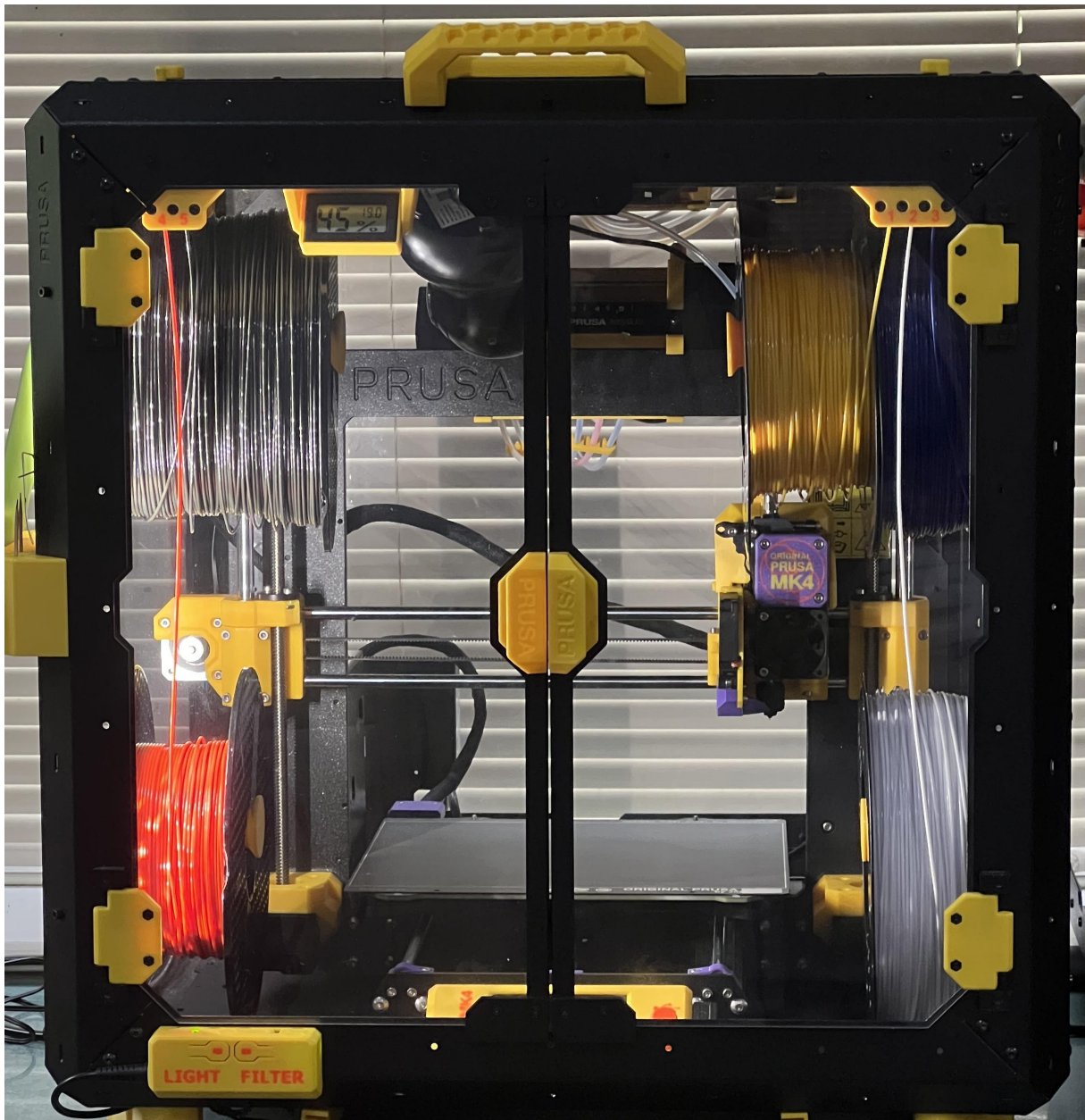
Some of these are shown in the photo below (note that these are the V3 brackets, not the latest V3.1).



That might be a confusing number of options. For my setup I have the following:

- In the front-top-right corner (the conventional position) I have the 'FTR 3 screws 2 spindles spare' bracket (the bracket on the left in the above photo), which gives me all possible options for 1kg or 2kg spools, including those with a larger diameter.
- In the front-top-left corner I have the 'FTL 3 screws 1 spindle spare' bracket, which allows me to use a 2kg spool as one of the five spools (but only if it has the same diameter as a 1kg spool, since this bracket has no option for a larger diameter spool).
- In the front-bottom-left corner I have the 'FTR 2 holes 1 spindle spare' bracket (the bracket on the right in the above photo). This is only suitable for a 1kg spool, which is all I'm likely to use in that corner.
- In the front-bottom-right corner I have the same setup as the front-bottom-left corner, but with the FTL equivalent bracket.

I use this configuration together with an internally mounted MMU3 buffer on the underside of the hinged enclosure lid. My kit of parts to help with mounting the buffer this way is available [here](#).



I have included the updated OpenSCAD file that I used to generate these new brackets.

The spindles have not changed since the earlier version, and these are now in their own folder. The files for the earlier Version 2 bracket have been moved to their own folder.

Which parts should you print?

The complete holder consists of three parts:

1. A bracket that mounts to the enclosure frame,
2. A spindle that screws into the bracket (four lengths are provided: 75mm, 90mm, 125mm 165mm),
3. An optional spindle extension (50mm or 75mm) to go between the bracket and the spindle.

The 75mm spindle will suit a standard 1kg spool, and adding the 50mm extension makes it wide enough for a 125mm 2kg Prusament spool. Alternatively you can print the 125mm spindle. I have found, however, that the screw joint between the spindle and the extension is very secure, so there's no apparent benefit in printing one long spindle, and in fact printing it in two parts saves on filament and print time compared to printing one short spindle and one long spindle! The 75mm spindle plus the 75mm extension is wide enough for two standard 1kg spools.

Print Settings

The STLs are provided in the correct orientation for printing. No supports are needed.

My suggested print settings here are all about ensuring adequate strength to support 2kg of filament, and fine enough detail to ensure that the parts screw together cleanly.

I've used PETG for my prints, and a 0.4mm nozzle.

My print settings are based on the '0.2mm STRUCTURAL' setting in PrusaSlicer, with the layer height changed to 0.3mm purely for speed. If you've got the patience, you may prefer to print everything with the '0.2mm Quality' setting. **Additionally, for increased strength, I prefer 4 perimeters, 5 top and bottom layers, and 40% cubic infill.**

The spindle in this model has a diameter of 24mm, the same as Prusa's original spindle. I have found that 24mm is adequate, and the main cause of any flex when the 2kg spindle is fully loaded is the flexure of the enclosure frame itself, rather than the spindle. **Nevertheless, to ensure the strength of the spindles and the extension, particularly the threaded sections, I use solid infill for the top (threaded) portion, starting 5mm below the start of the male thread (use a 'Height Range Modifier' to configure this).** With these settings the area around the female threaded section at the bottom of the extension and in the bracket will also effectively be solid, due to the 4 perimeters. For the longer spindles you may wish to use a 5mm brim if you are at all concerned about the adhesion between your filament and print sheet, since the y-axis can shake rather fast with Input Shaper speeds.

Assembly

- As with Prusa's original spool holder, push nuts into the three recesses in the main bracket.
- Remove the original spool holder and, if fitting a '3 screws' bracket, remove the plastic rivet from the side panel where the extra screw

will fit. Use three M3x12 screws to secure the bracket to the enclosure frame.

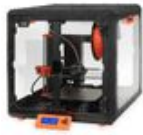
- Screw a spindle, or a spindle+extension, into one of the holes in the mounting bracket. If your spool has the same diameter as a typical 1kg spool, use the spindle mounting hole that is closest to the door. The other mounting hole should accommodate spools with a diameter up to ~80mm-90mm larger, and there should be enough space between the spindle and the top panel to accommodate the same increase.
- I have built in a small (0.6mm) tolerance between the male and female screw threads, so that the fit is tight-but-not-too-tight. With a clean print in PETG this gives a good fit, and the parts tighten together quite nicely. In fact, if you over-tighten them they can be difficult to separate, and moreover you will put more stress on the threaded sections, so gentle hand tightening should be sufficient. If your threaded parts are a bit tight initially, possibly due to stringing or slightly uneven overhang on the threads for instance, use a small amount of lubricant such as WD40, and work the threads - one turn in, half a turn back out, etc - until the pieces screw in fully. After that they should screw together easily.

Customisation

I have included an STL with a couple of test pieces (in the spindles folder). These are intended for you to print out to check the fit between the male and female threads, and to check the fitment of a hexagonal nut in a deep nut slot. Different printer settings and different filaments may lead to different fitments/tolerances, particularly if the extrusion multiplier is a little off. The provided STLs and printer settings work well on my printer with my chosen filament, but your experience might be different. If you print these two test parts out and everything fits together nicely, then you don't need to do anything else before printing out the bracket and the spindle parts.

However, if you prefer to adjust the tolerance between the male and female screw threads, or you wish to adjust the size of the nut slots, or you just want a bespoke spindle length, then I have provided the OpenSCAD script for you to tinker with. There are many customisable parameters within the script - you can even change the size and spacing of the hexagon lattice. The parameters should be self-explanatory so I won't describe them here, but if you need help/advice with any of the settings, I'll be happy to help if you message me.

This remix is based on



Enclosure Printable Parts

by Prusa Research



2KG Spool Holder For Original Prusa Enclosure

by Brolin Workshop

Model files



Version 3.1 brackets - 22 April 2024

13 files



ftr-2-screws-1-spindle-spare.stl



ftr-3-screws-1-spindle-spare.stl



ftr-3-screws-2-spindles-spare.stl



ftr-2-screws-1-spindle-no-spare.stl



ftr-3-screws-1-spindle-no-spare.stl



ftr-3-screws-2-spindles-no-spare.stl



ftl-2-screws-1-spindle-spare.stl



ftl-3-screws-1-spindle-spare.stl



ftl-3-screws-2-spindles-spare.stl



ftl-2-screws-1-spindle-no-spare.stl



ftl-3-screws-1-spindle-no-spare.stl



ftl-3-screws-2-spindles-no-spare.stl

configurable-spool-holder-v31.scad



Spindles

7 files



spindle-75mm.stl



spindle-90mm.stl



spindle-125mm.stl



spindle-165mm.stl



extension-50mm.stl



extension-75mm.stl



test-pieces.stl



Version 3 brackets - superseded 22 April 2024

13 files



ftr-2-screws-1-spindle-spare.stl



ftr-3-screws-1-spindle-spare.stl



ftr-3-screws-2-spindles-spare.stl

ftl-2-screws-1-spindle-no-spare.stl



ftl-3-screws-1-spindle-no-spare.stl



ftl-3-screws-2-spindles-no-spare.stl



ftl-2-screws-1-spindle-spare.stl



ftl-3-screws-1-spindle-spare.stl



ftl-3-screws-2-spindles-spare.stl



ftl-2-screws-1-spindle-no-spare.stl



ftl-3-screws-1-spindle-no-spare.stl



ftl-3-screws-2-spindles-no-spare.stl



configurable-spool-holder-v3.scad



Version 2 - superseded 17 April 2024

5 files



bracket-v2.stl



bracket-v1.stl



spool-holder-set.stl



spool-holder-set.3mf

☐ includes bracket v2

configurable-spool-holder.scad

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