Daemon3D Print

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Setting Up a New Smart Extruder+

Why to Calibrate

Every MakerBot Smart Extruder+ and 3D printer MakerBot send out is tested in their factory, but they be small variations between individual printers and extruders. If you are connecting a new extruder to your MakerBot printer for the first time, you will need to perform some calibration steps to compensate for any difference.

You should follow these steps before printing whenever you install an extruder for the first time. Once your extruder is set up for a specific MakerBot 3D printer, you can attach and detach it as many times as you like without going through this process again.

1. Install the extruder

Locate and unwrap the Smart Extruder+ and press it against the back of the extruder carriage, with the connector pins facing the front of the MakerBot 3D printer. Magnets will lock the extruder into place.

2. Update Firmware

It's important to always keep your MakerBot 3D printer's firmware up to date. Firmware updates often include improvements to Z-axis homing, and your extruder may not home correctly if you don't have the newest version.

3. Start a Print

Monitor the first layer of your print carefully. If the extruder nozzle scrapes against the built plate, or if you receive a homing error, the extruder is too close to the plate. If the plastics coming out the extruder doesn't adhere well to the build plate, the extruder is too far from the plate. In either case, you can recalibrate the Z-axis offset or manually adjust the Z-axis offset to correct the starting height of the build plate.

Smart Extruder+ Tips

These are some tips for avoiding clogs and extending the life of your Smart Extruder+.

- Your MakerBot 3D printer's cooling process is designed to prevent filament clogs. Always wait for the extruder to cool to 50°C before detaching it or turning off your MakerBot 3D printer.

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- Wait until the extruder finishes unloading your filament before pulling it free. Always allow the Smart Extruder+ to do most of the work when unloading filament.
- Prevent tangles in the filament by keeping filament tightly wound when switching spools.
- When changing filament, allow plastic to extrude for several seconds to ensure all residue and partial blockages are cleared from the thermal barrier tube.
- If no filament is coming out of the nozzle, or if you're eharing a clicking noise when your MakerBot 3D printer starts a print, your extruder may be a little too close to the build plate. This can cause plastic to back up into the extruder and cause clogs.
- Printing in a warm or humid environment can contribute to frequent nozzle clogs. Try to print in a cool, dry environment.
- Keeping your software and firmware up to date will help ensure that your MakerBot 3D printer and MakerBot Print run as smoothly as possible.

How to Install the Extruder

Unwrap the Smart Extruder+ and press it against the back of the extruder carriage, with the connector pins facing the front of the MakerBot 3D printer. Magnets will lock the extruder into place.

Note: It might not be obvious where to attach the extruder if the gantry is positioned all the way at the back of the printer. When your MakerBot 3D printer is paused or not printing, use both hands, one at each end of the gantry, and apply equal pressure to move the gantry forward. It is not safe to manually move the gantry when your 3D printer is printing.

When the extruder is in place, check the control panel screen. If the extruder icon on the home screen looks normal, your extruder is connected properly. If you see a silhouette of the extruder icon, select it to the run the extruder attachment script. The carriage motor will turn to ensure that the extruder fits snugly against the extruder carriage.

Changing Extruders

You can install or change extruders at any time as long as your MakerBot 3D printer is turned on. If your MakerBot 3D printer is printing, navigate to the Print/Options menu and select **Pause.** Wait for the extruder to cool to at 50°C. Remove the extruder and replace it with the new one, then select **Attach Smart Extruder.** Once

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you have attached the new Smart Extruder+, navigate to the Print/Options menu and select **Resume** to resume printing.

Loading Filament

The MakerBot Replicator+ is optimized for large (0.90 kg) and small (0.22 kg) spools of MakerBot PLA filament.

Installing a Filament Spool

Open the filament drawer by pulling up the back section of the frame of the MakerBot Replicator+. Position the filament spool so that it will unwind counter clockwise and fit the spool onto the filament spindle. Be careful not to let the filament loosen or tangle on the spool.

Detach the free end of the filament from the spool and insert it into the filament guide tube at the upper right corner of the filament drawer. Push filament through the tube until the free end emerges from the end of the guide tube.

Hold the top of the filament drawer with one hand and depress the latch on the filament drawer. Slide the filament drawer closed.

Loading Filament into the Smart Extruder+

1. Use the control panel dial to select Filament > Load Filament.
2. Wait for the extruder to heat.
3. Cut the end of your filament to create a clean edge. You can use scissors or wire cutters to cut a clean edge on the end of your filament. You don't want to load anything with a bulged, twisted or sharp edge.
4. Grasp the top of the extruder assembly and push the filament into the extruder's loading tube until you can feel the motor pulling the filament in. If you're running into a problem during this process, unload the filament and repeat step 3. It may help to press the lever on the side of the extruder and gently feed filament towards the hot end at this point.
5. Wait until you see plastic emerging from the extruder nozzle before pressing the control panel dial to finish the filament load process.
6. Fit the filament guide tube securely into the extruder's loading tube.

Unloading Filament

How to Unload Filament

1. Use the control panel to select **Filament > Unload Filament.**

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2. The Smart Extruder+ will start to heat up. When the extruder is fully heated, it will go through ha two-part unloading process.
3. Remove the filament from your extruder only when prompted by the control panel. If you feel resistance when removing the filament, pinch the two tabs on the extruder to remove the filament.

If you are changing filament spools, be careful to keep the spool tightly wound as you pull the filament free of the guide tube. If you do not, the filament could unravel or tangle on the spool.

Note: If your MakerBot 3D printer senses that the extruder has run out of filament, it will display a message and automatically run the Unload Filament script.

Avoiding Clogs

To help prevent clogging, always let your printer fully complete the filament loading and unloading procedures. Never remove filament from the extruder before instructed to do so by the control panel.

After finishing a print, your MakerBot 3D printer cools the extruder to quickly harden the melted plastic inside. Always wait until your Smart Extruder+ has cooled to 50°C before turning of your MakerBot 3D printer. This process can take a few minutes, but if you turn off your MakerBot 3D printer before the extruder is fully cooled, you may risk a higher chance of a clog forming.

Changing Filament

How to Change Filament

The easiest way to change the filament for your MakerBot 3D printer is to use the control panel.

1. Select **Filament > Unload Filament.**
2. The Smart Extruder+ will start to heat up. When the extruder is fully heated, it will go through a two-part unloading process. Remove the filament from the extruder only when prompted by the control panel.
3. Open the filament drawer and remove the old spool. Be careful to keep the spool tightly wound as you pull the filament free of the guide tube. Place the new spool in the filament drawer.
4. Select **Filament > Load Filament.**
5. Wait for the Smart Extruder+ to heat.
6. Cut the end of your new filament to create a clean edge.

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7. Grasp the top of the extruder assembly and push the filament into the loading tube in the extruder until you can feel the motor pulling the filament in.
8. Wait until you see plastic emerging from the extruder nozzle before pressing the control panel dial to finish the filament load process.

Note: If you're changing colours, you'll need to run the extruder for a few moments to clear out the old colours before finishing the filament load process.

Changing Filament During a Print

To replace a spool that's running low, or to create a print with layered colours, you can change filament during a print. Go to **Menu > Print** and select **Change Filament.** This will pause your print and take you directly to the **Filament** menu. Then follow the steps above before resuming your print. If you're up to date with the latest firmware a software, you can also allow your Smart Extruder+ to run out of filament. This will cause your MakerBot 3D printer to run the **Unload Filament** script. When the extruder has finished unloading, wait for it to cool to at least 50°C. Remove the last piece of filament from the extruder, then select **Load** Filament. When you have finished the load sequence, go to **Back to Menu > Resume.**