Release Notes for Windows Pro Software
Last Update: 2017.08.02
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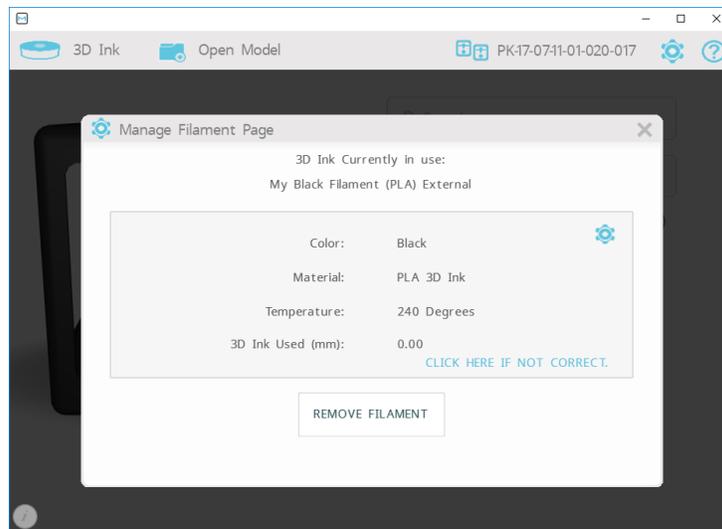
Release 1.7.1.20-WIN (2017.08.02)

- Streamlined Micro+ and Pro new printer connection process
- Improved print option handling for Micro+ and Pro printers
- Improved motion planning for both Micro+ and Pro printers
- Improved power-on sequencing for Pro printers at start of print
- Bed find, bed level compensation and test border implemented for Pro printers (first use requires additional user input, read "Bed Probing and Leveling" section below)

Known Issues
- (I-120-1) When printing in ABS-R filaments, a G-Code preprocessor in the M3D software sets the fan speed to an arbitrarily low value (20% electrical power) based on legacy Micro behavior. Prints will begin without issue and may complete, but depending on print size and duration, the extruder can warm filament to a softening point that will prevent extrusion and results in print failure. (We have seen this effect at roughly 1.5 hours into a print.)
  Workaround: The low fan value is selected based on knowledge of what filament is loaded into a particular printer. To prevent this low fan value from being used during a print, the filament type can be manually overridden. Using the "3D Ink" dialog, and assuming your filament is already loaded, choose "CLICK HERE IF NOT CORRECT." to manually override the filament knowledge presented to software. We recommend using a code of "PLA", followed by restoring your desired printing temperature (240 degC by default for ABS-R) using the gear icon within the dialog. When successfully completed, your filament options should appear similar to the below (in particular, the "Material" should show PLA and "Temperature" should be as you desire):

  A fix for this particular issue, as well as expanded fan control options, have already entered development and are slated for a future release.

Details of Release 1.7.1.20-WIN

Motion Planning

  Path planning has come to M3D printer models! This means that we can now attain proper bed leveling across prints with large footprints without causing a major sacrifice in print speeds, and without causing unsightly print artifacts at the junction of discrete printing moves.

  That said, our current implementation is a bit crude. Models with very complex geometries or a high mix of printing and non-printing (travel) moves may suffer from print irregularities when mixing this somewhat-naïve path planning implementation with high attempted speeds.

  The promise of the Pro remains that our continuing firmware development will provide multiple strategies to combat these occurrences – prevention, detection and correction of printing errors – but in the near-term, if prints are seen to suffer on the basis of our path planning algorithm, we recommend lowering print speeds to recover print quality. And of course, we are interested in hearing user results so that we know how best to focus our efforts in firmware development!
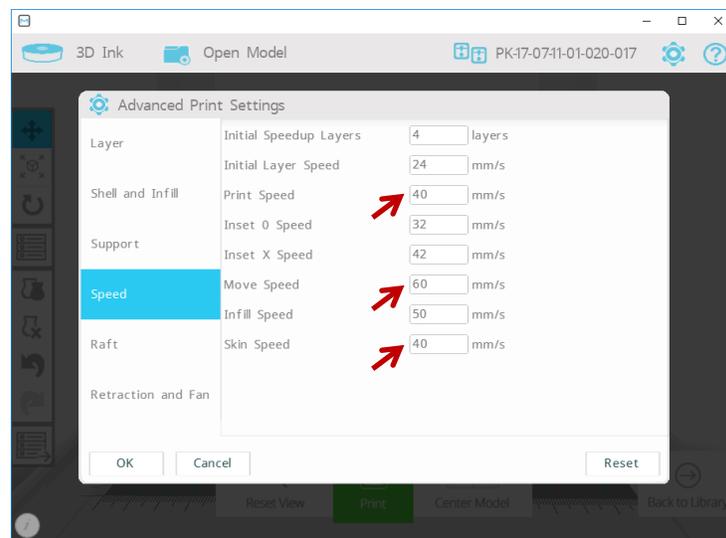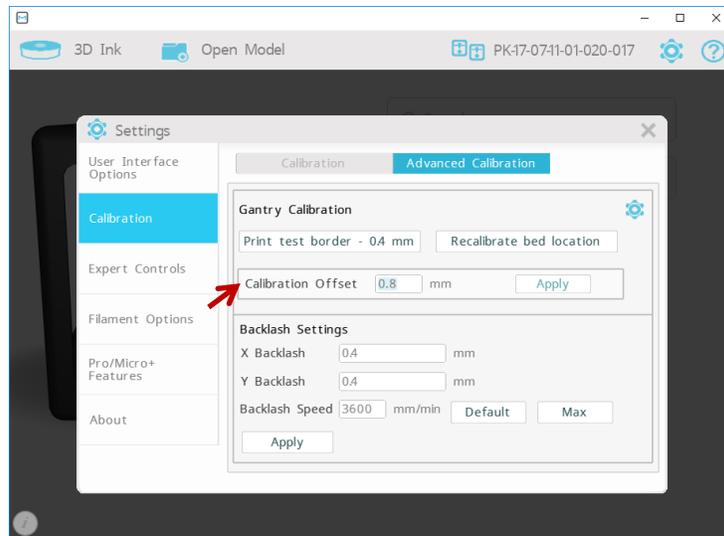

    Here you can see recommended top-end print speeds for a model of moderate to high complexity. Most importantly, we have lowered the print speed, move speed and skin speed from their default values on the Pro. For extreme complexity, it would be prudent to lower speeds further.

Bed Probing and Leveling

  The bed find limitation documented at I-021-1 (original notes at 1.7.0.21 below) is remedied in this release, and single-point and multi-point bed find algorithms (G30 and G32, respectively) have been improved to match the dynamics of the latest printer hardware. A test border feature is implemented as a means to verify proper bed level calibration.

  As explained at I-021-1, manufacturing variability along with improvements made to Pro hardware since its alpha phases mean that a given printer has a particular offset that can be used during its calibration procedures to give the best results. We find this is generally in the range of 0.6 to 1.2 mm of additional lift beyond the baseline bed probe procedure. I-021-1 discussed a workaround for achieving good calibration results using a sequence of manual G-Code commands each time the calibration needed to be performed; this is no longer required.

  The printer-specific bed calibration offset is now a configurable item in the calibration setting screens. Further, this offset value is stored in printer memory and will follow the printer when transported and connected to any new host PC. This item is available on the "Advanced Calibration" tab:

Settings

User Interface Options

Calibration | Advanced Calibration

Gantry Calibration

Print test border - 0.4 mm | Recalibrate bed location

Calibration Offset 0.8 mm | Apply

Expert Controls

Filament Options

Pro/Micro+ Features

About

Backlash Settings

X Backlash 0.4 mm

Y Backlash 0.4 mm

Backlash Speed 3600 mm/min | Default | Max

Apply

3D Ink | Open Model | PK-17-07-11-01-020-017

   The value specified for "Calibration Offset" is used as a parameter to the "Recalibrate bed location" command (which itself is roughly equivalent to sending a G30 manually) as a printer-specific offset for how much flex is encountered in the bed and gantry during bed probing. If you are consistently using the same bed with your printer, this value should only need to be adjusted from the factory value once, if at all.

To find the proper offset for your printer:
   1. Run the "Recalibrate bed location" procedure once. We recommend leaving the "Calibration Offset" at 0.8 mm initially, as it is when shipped from our factory.
   WARNING: Bed calibration heats the extruder to 150 degC. Exercise appropriate safety precautions.

   2. When the calibration procedure completes, the nozzle is meant to be 0.1 mm above the bed surface. This is roughly the thickness of one sheet of standard printer paper, which can be used as a reference. (A piece of paper should be able to slip between the bed and nozzle with its motion just barely constrained. If you can't fit a piece of paper, the nozzle is likely too close. If you can fit a piece of paper with extra room to spare, the nozzle is too far. However, adjust this check to your preference and particular printing requirements.)
   Determine if there is error in the final location of the nozzle following this calibration. Keeping track of the total distance moved, perform the following procedure: First send the manual command "M1012" to unlock printer bounds checking, then use the +/-Z jog controls to move the nozzle until it is positioned 0.1 mm above the bed. We recommend moving in 0.05 mm increments.

   3. Adjust the "Calibration Offset" by the travel distance you moved in the prior step. If you manually moved *away* from the bed, add to your current offset (0.15 additional movement away from the bed would raise the offset to 0.95 mm, for example). If you manually moved *toward* the bed, subtract from your offset (0.2 additional movement toward the bed would lower the offset to 0.6 mm, for example). Choose "Apply" once you have entered this new offset value.

   4. Finally, with the nozzle remaining at 0.1 mm above the bed surface, do one of the following: issue a manual "G33" command, or repeat the "Recalibrate bed location" process. If you choose to repeat the calibration procedure, given your newly adjusted offset (if adjustment was required), the nozzle should

come to a final location at 0.1 mm above the bed surface. We are finding this bed find procedure to be repeatable on a given printer to within +/-0.1 mm.

   Following bed location, calibration for the corners of the bed can be fine-tuned using the cat screen, as is customary.
   If you at times use different surface treatments on your bed (e.g. painter's tape, PEI, etc.) depending on the needs of a particular print, you can use the "Bed Height Offset" to account for these without changing the calibration procedure offset.
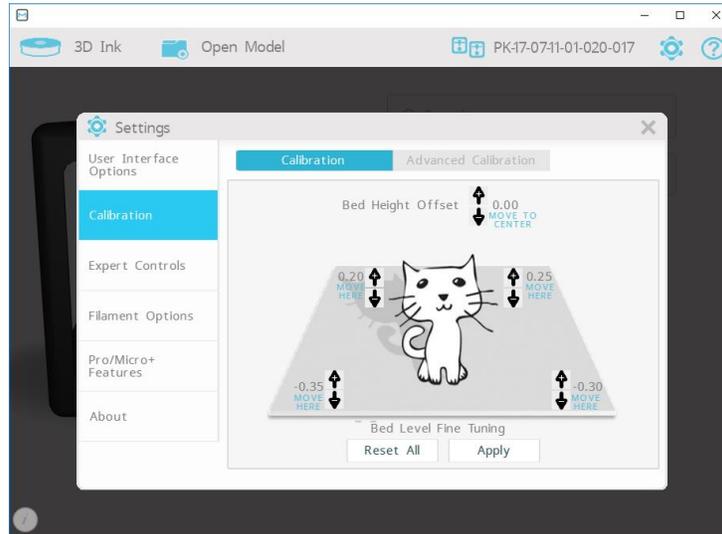
   Please note that whenever the "Recalibrate bed location" procedure is run manually, the "Bed Height Offset" in the cat screen is reset to 0.
   Users achieving good results with the "Recalibration bed location" should have no trouble with the "Re-probe bed (Experimental)" option in the print dialog window; this option performs the same procedure at the beginning of a print. (This option replaces the "Verify bed level (Recommended)" option that is currently used for the Micro and Micro+.)
   More information on bed leveling and how to print and interpret results of the test border is available through our website or by contacting our support team.

Release 1.7.0.73-WIN-ALPHA (2017.05.19)

- Incremental software release supporting latest Pro and Micro+ printers
- Heated bed control (experimental) for the Pro
- ~~Fully-automated bed level and backlash calibration for the Micro+~~

Known Issues
- The bed find limitations documented at I-021-1 remain unchanged in this version (see notes at 1.7.0.21).

- The gantry clip detection issue I-020-1 remains unfixed in this version (see notes and workaround at 1.7.0.20).

Release 1.7.0.72-WIN-ALPHA (2017.05.02)

- Incremental software release supporting Pro Beta (hardware level) printers

Known Issues
- The bed find limitations documented at I-021-1 remain unchanged in this version (see notes at 1.7.0.21).

- The gantry clip detection issue I-020-1 remains unfixed in this version (see notes and workaround at 1.7.0.20).

Release 1.7.0.71-WIN-ALPHA (2017.04.26)

- Maintenance alpha release supporting Pro printers
- Bug fixes mainly targeting usability

Known Issues
- The bed find limitations documented at I-021-1 remain unchanged in this version (see notes at 1.7.0.21).

- The gantry clip detection issue I-020-1 remains unfixed in this version (see notes and workaround at 1.7.0.20).

Release 1.7.0.21-WIN-ALPHA (2017.04.17)

- Incremental alpha release supporting Pro printers
- Improved "G30" single-point bed find for the Pro (still experimental)
- Prime outside the expected print perimeter to improve print success
- Enhanced motion away from printed objects at end of print
- Implement automated software updater features

Known Issues
- (I-021-1) While the "G30" bed find algorithm has been improved from that in v1.7.0.20 (Windows-only release), it remains in its very early stages and may produce inconsistent results based on printer-to-printer variability. When preparing to print, the "Verify bed level (Recommended)" option is selected by default and invokes this bed find algorithm prior to beginning the print.
  Workaround: Pros are shipped with their Z location pre-verified through prior print tests. The printers should need recalibration only under extended use or special circumstances. It's recommended users de-select the "Verify bed level" option before printing.
  If a user would like to explore the function of G30, we'd recommend sending the command manually in the Spooler or GUI rather than using the "Verify bed level" as part of a print:
    – The extruder should be centered on the bed before homing Z. If not already centered, send "G28".
    – WARNING: G30 will heat the extruder to 150 degC. Exercise appropriate safety precautions.

– Our suggested starting point for Z homing is "G30 Z0.4". The Z parameter tells the extruder to back off this additional distance (mm) from the bed to compensate for bed flex. When the procedure is complete, the nozzle should be 0.1mm above the bed. (As a reference, a piece of paper should be able to slip between the bed and nozzle with its motion just barely constrained. If you can't fit a piece of paper, the nozzle is likely too close. If you can fit a piece of paper with extra room to spare, the nozzle is too far. However, adjust this check to your preference and particular printing requirements.)

    – The Z parameter in the G30 command can be adjusted to leave the nozzle in the appropriate position. A larger (positive) Z value will lift the nozzle further away from the bed. A smaller or negative value will keep the nozzle's end position closer to the bed. Any value 3.0 or greater in magnitude will be ignored, however.

  If you prefer not to use the experimental G30 feature to recalibrate Z location when needed, we recommend a manual procedure making use of either the G33 or G92 command to set a known Z location.

- (I-021-2) For those with software updater feature set to automatically "Download And Install" or automatically "Download, Don't Install," a software update may have successfully downloaded but the expected install action (automatic or user-to-confirm) will not trigger. This is caused by the software update process only running on software startup, and being disabled while printers are active or handshaking.

  Workaround: Use the "Install Now" button on the software updater ("Advanced") tab of the settings window, or restart the software with all printers initially disconnected from the computer.
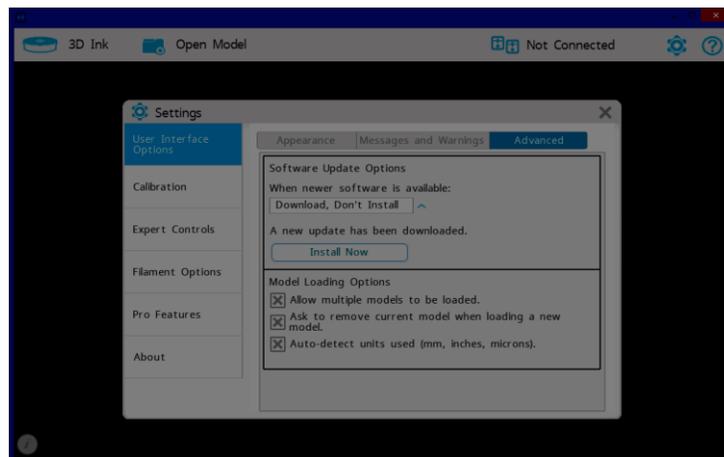
- The gantry clip detection issue I-020-1 remains unfixed in this version (see notes and workaround at 1.7.0.20).

Release 1.7.0.20-WIN-ALPHA (2017.04.02)

- First public (alpha) release that supports Pro printers

Known Issues
- (I-020-1) Pros do not ship with gantry clips and there is no gantry clip detection routine programmed into the printer's firmware. If you start the software with a new Pro already connected to the computer, you will see a dialog asking to perform gantry clip detection.

Workaround: Choose "Cancel" when prompted that a new printer has been connected and it must be tested for gantry clip removal before it can be used. Choose "OK" to the dialog that mentions "You will not be able to use your printer until your gantry clips have been removed." You should be able to print without issue and should not be asked again for the same printer.

- (I-020-2) The bed find algorithm is in its very early stages and is unlikely to produce reliable results at the moment. When preparing to print, the "Verify bed level (Recommended)" option is selected by default and invokes this bed find algorithm (G30) prior to beginning the print.

Workaround: Pros are shipped with their Z location pre-verified through prior print tests. The printers should need recalibration rarely. It's recommended users de-select the "Verify bed level" option before printing. To recalibrate Z location when needed, it's recommended to follow a manual procedure making use of either the G33 or G92 command to set a known Z location.