

# 3D Druck

- Ender 3

# Ender 3

## Software

### Klipper

#### Installation auf OctoPi

```
# for more info see https://www.klipper3d.org/Installation.html  
git clone https://github.com/KevinOConnor/klipper  
./klipper/scripts/install-octopi.sh
```

#### Flashen der Firmware

1. ins Klipper Verzeichnis wechseln

```
$ cd ~/klipper/
```

2. MicroController Einstellungen vornehmen

```
$ make menuconfig
```

```
(Top)
Klipper Firmware Configuration
[*] Enable extra low-level configuration options
  Micro-controller Architecture (Atmega AVR) --->
  Processor model (atmega1284p) --->
  Processor speed (16Mhz) --->
  Communication interface (UART0) --->
[ ] Compile for simulavr software emulation
(250000) Baud rate for serial port
[ ] Specify a custom step pulse duration
( ) GPIO pins to set at micro-controller startup

[Space/Enter] Toggle/enter    [?] Help    [/] Search
[Q] Quit (prompts for save)    [ESC] Leave menu
```

### 3. Firmware kompilieren

```
$ make
...
Building out/compile_time_request.o
Version: v0.9.1-545-gb513d085
Linking out/klipper.elf
Creating hex file out/klipper.elf.hex
```

### 4. korrekten seriellen Port ermitteln

```
$ ls /dev/serial/by-id/*
/dev/serial/by-id/usb-FTDI_FT232R_USB_UART_A107C7LJ-if00-port0
```

### 5. Flashen der Firmware

```
$ sudo service klipper stop
$ make flash FLASH_DEVICE=/dev/serial/by-id/usb-FTDI_FT232R_USB_UART_A107C7LJ-if00-port0
avrdude: AVR device initialized and ready to accept instructions

Reading | ##### | 100% 0.01s

avrdude: Device signature = 0x1e9705 (probably m1284p)
avrdude: reading input file "out/klipper.elf.hex"
avrdude: writing flash (24142 bytes):

Writing | ##### | 100% 4.55s
```

```
avrdude: 24142 bytes of flash written
avrdude: verifying flash memory against out/klipper.elf.hex:
avrdude: load data flash data from input file out/klipper.elf.hex:
avrdude: input file out/klipper.elf.hex contains 24142 bytes
avrdude: reading on-chip flash data:
```

```
Reading | ##### | 100% 5.18s
```

```
avrdude: verifying ...
avrdude: 24142 bytes of flash verified
```

```
avrdude: safemode: Fuses OK (E:00, H:00, L:00)
```

```
avrdude done. Thank you.
$ sudo service klipper start
```

## Konfiguration des Klipper Dienstes

<https://github.com/swablab/ender3/blob/main/printer.cfg>

### PID Bed

### PID Extruder

### bltouch offset

## Hardware

## Ersatzteile

- [Bowden Tube Clip v3 \(E3D Threaded Version, PETG, 0.1mm\)](#)

## Slicing

Infos zum Thema Slicing gibts unter [PrusaSlicer](#).