

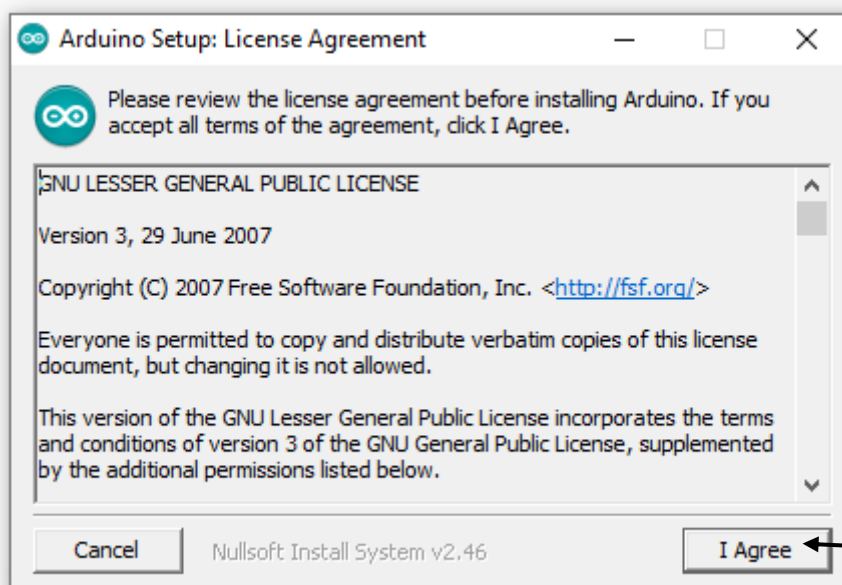
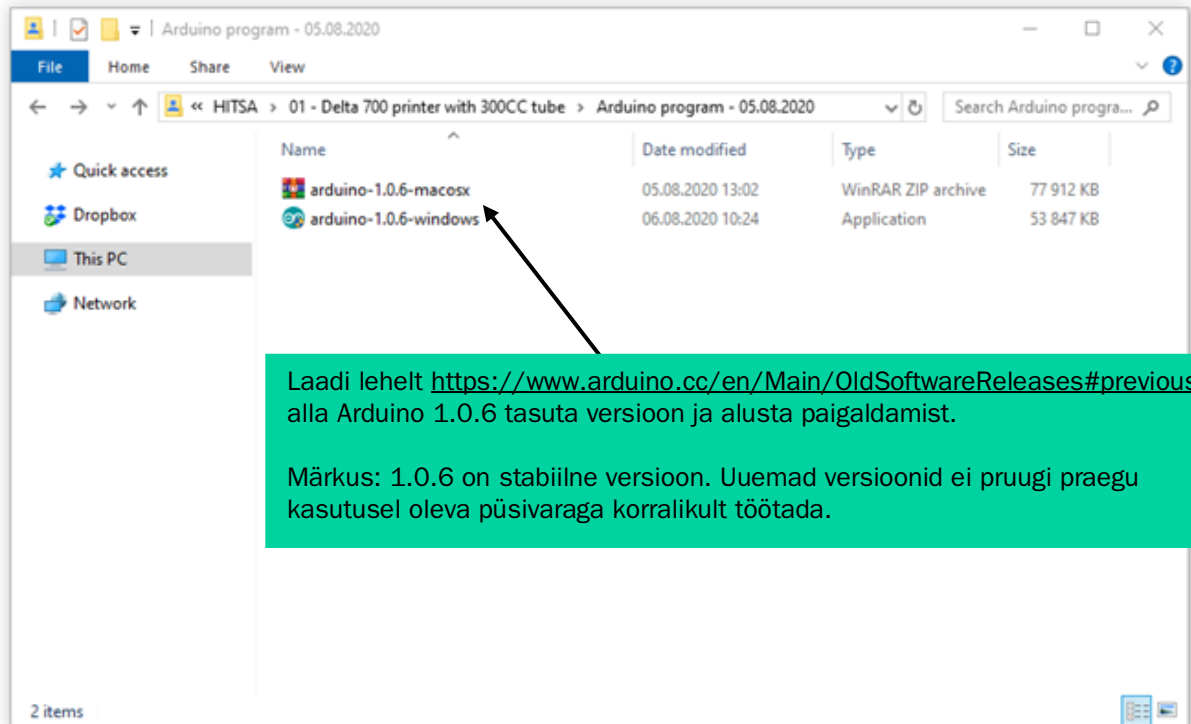


**Cartesiuse 3D-lameprinteri kasutusjuhend
Arduino IDE ja Marlini püsivara jaoks**

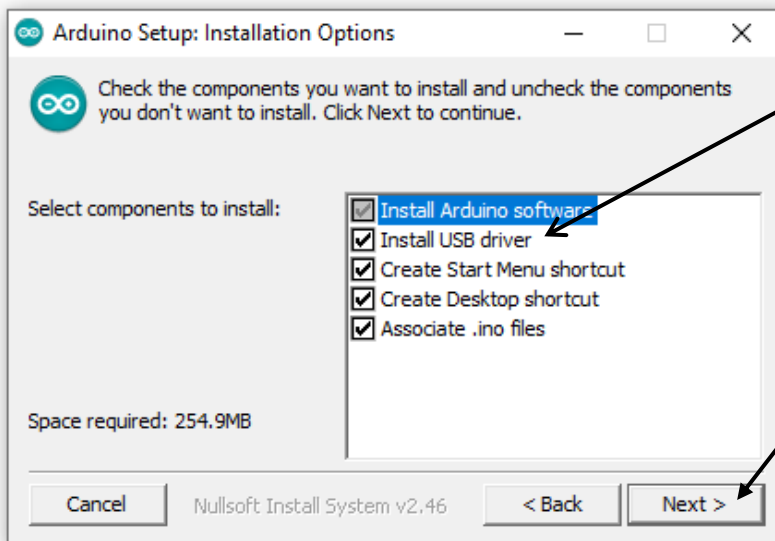
Dokumendis käsitletav:

- 1. Arduino Integrated Development Environmenti (IDE) paigaldamine ja häälestamine viskoosset materjali printiva Cartesiuse 3D-lameprinteris jaoks.**
- 2. Viskoosset materjali printiva Cartesiuse 3D-lameprinteris kontrolleri püsivara paigaldamine ja uuendamine.**

1. Arduino Integrated Development Environmenti (IDE) paigaldamine ja häälestamine viskoosset materjali printiva Cartesiuse 3D-lameprinteriga

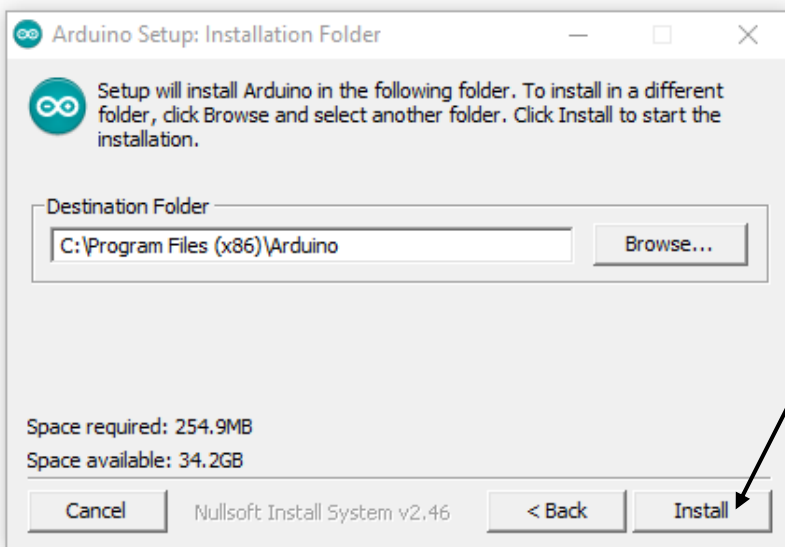


Nõustu

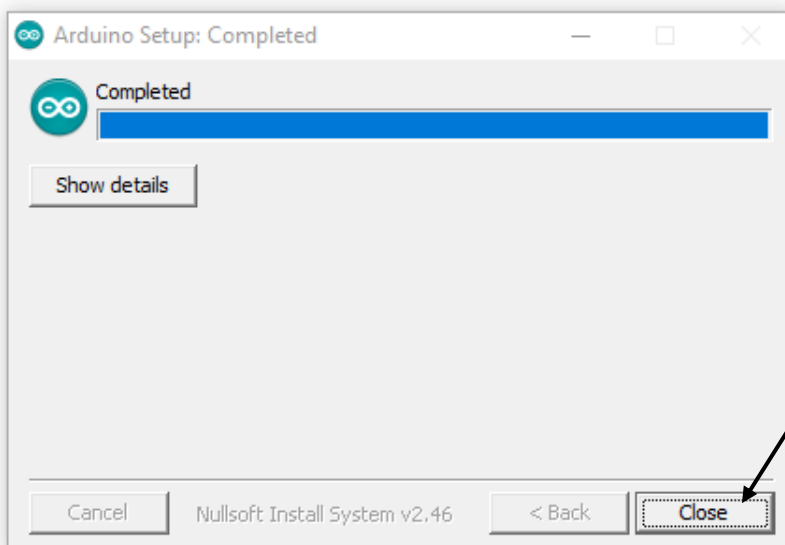


Printeri arvutiga ühildumiseks on vaja Arduino USB-draiverit.

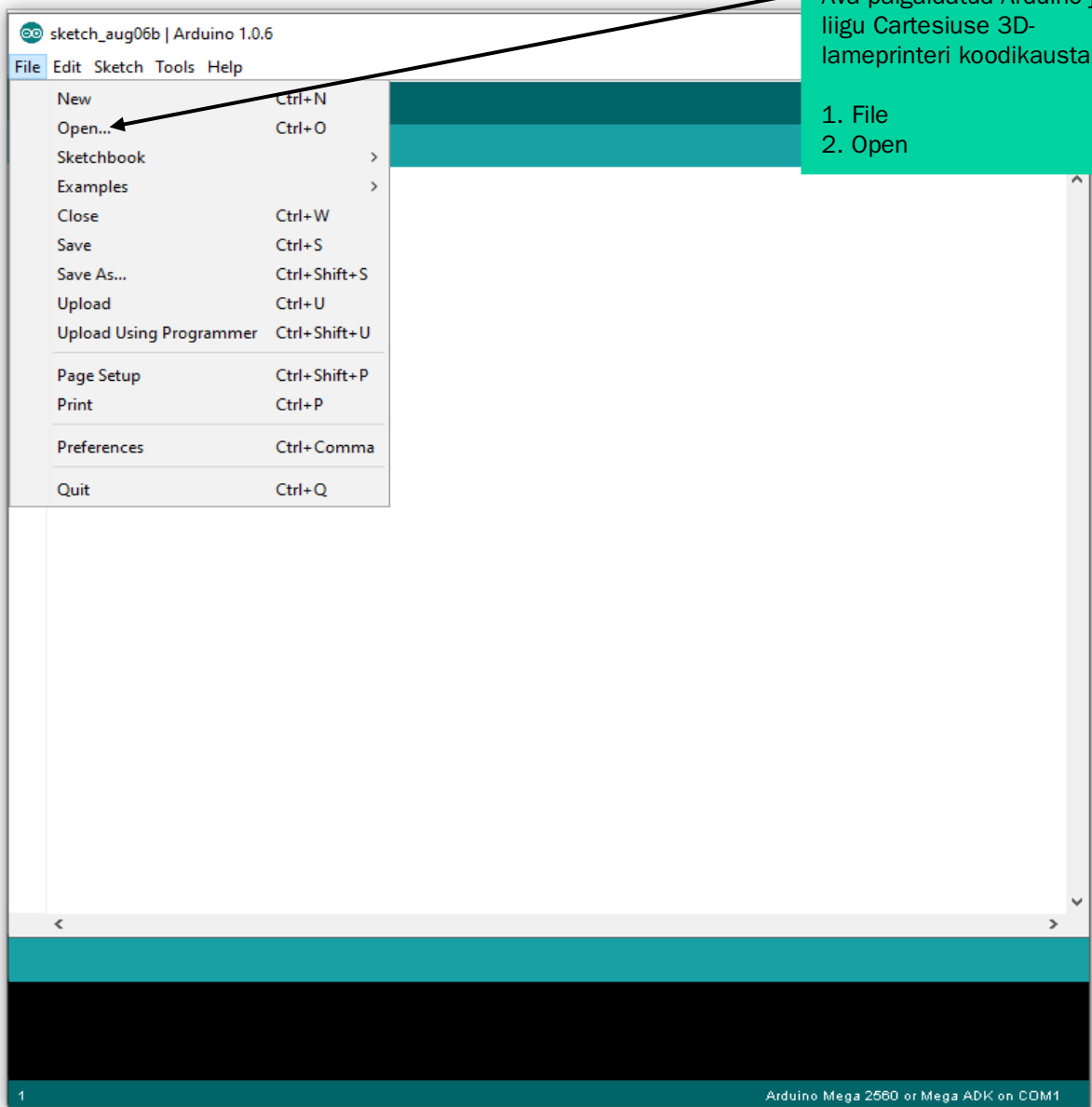
Liigu edasi



Paigalda

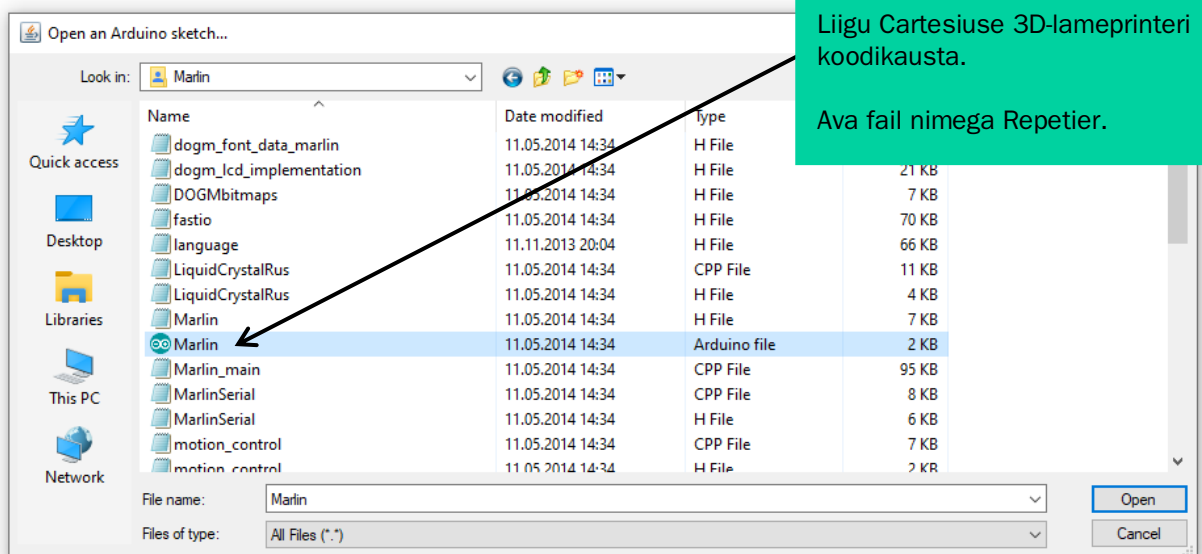


Sulge



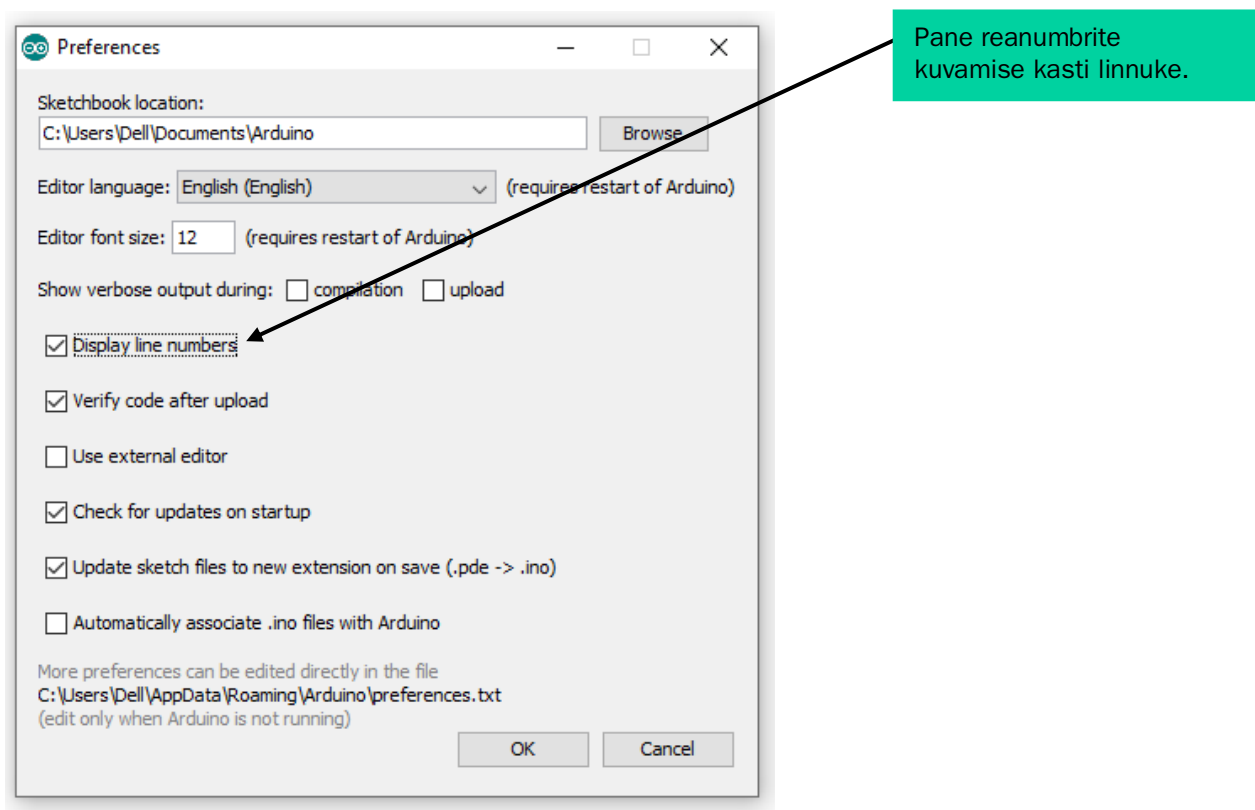
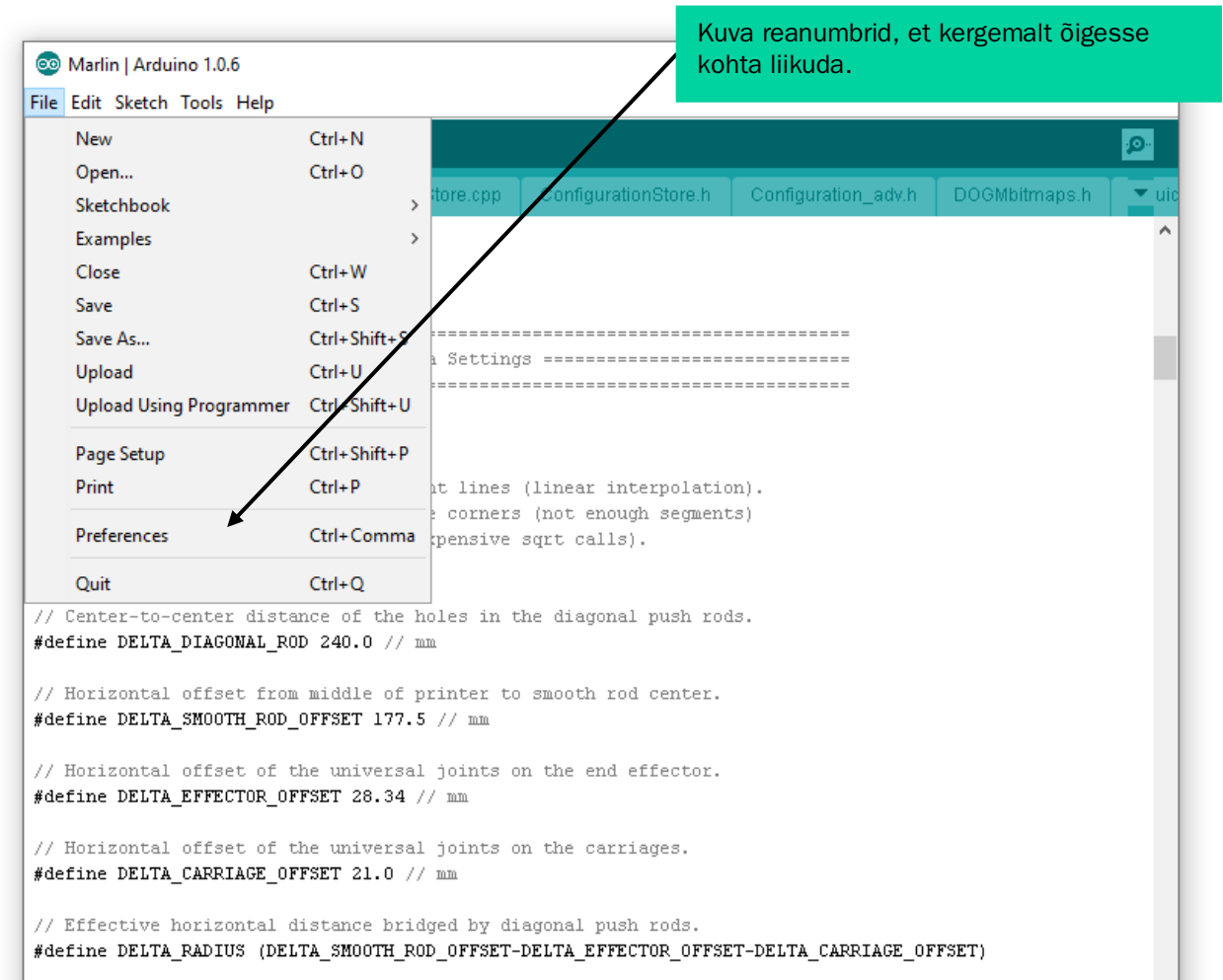
Ava paigaldatud Arduino ja liigu Cartesiuse 3D-lameprinteri koodikausta.

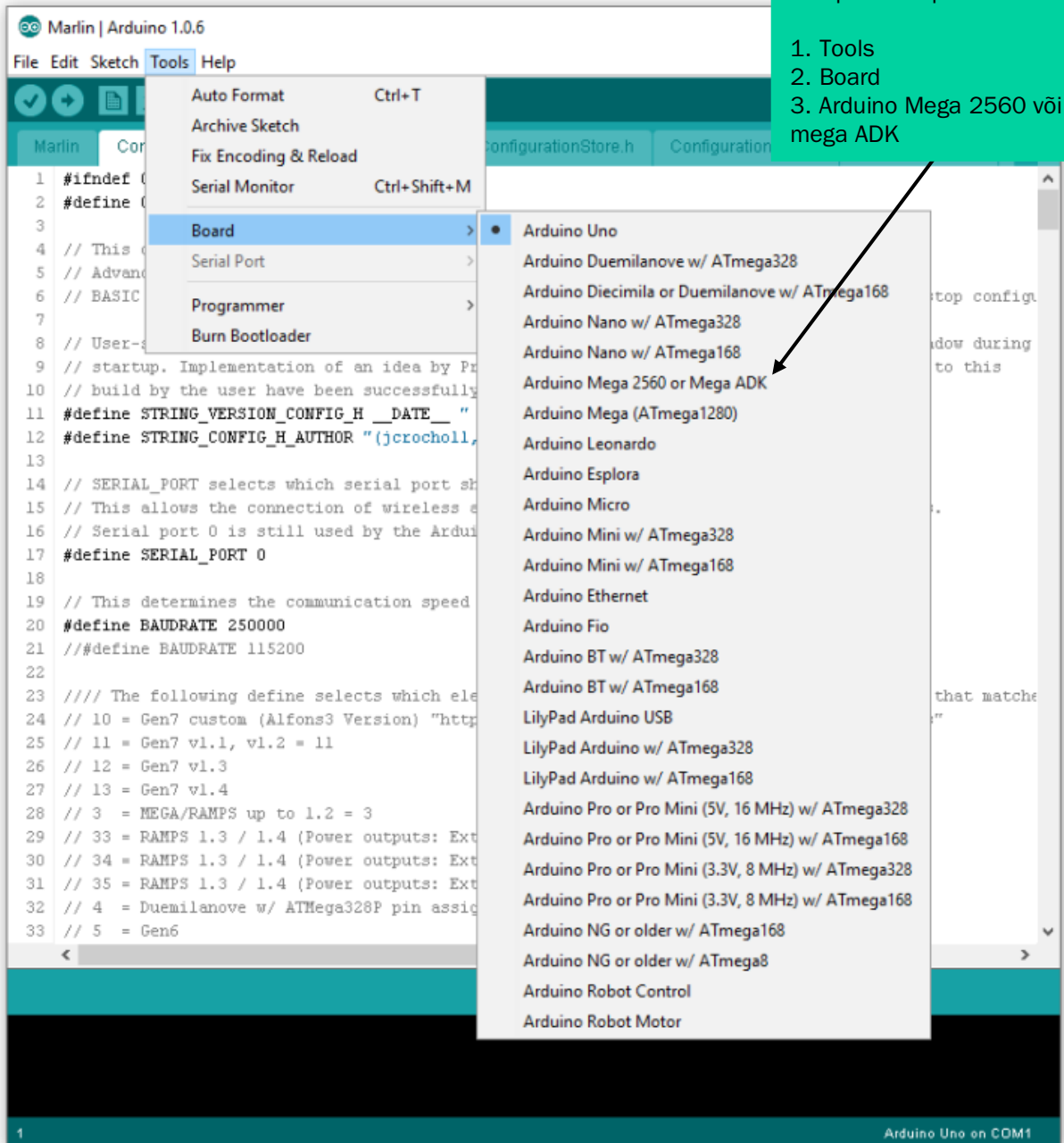
1. File
2. Open

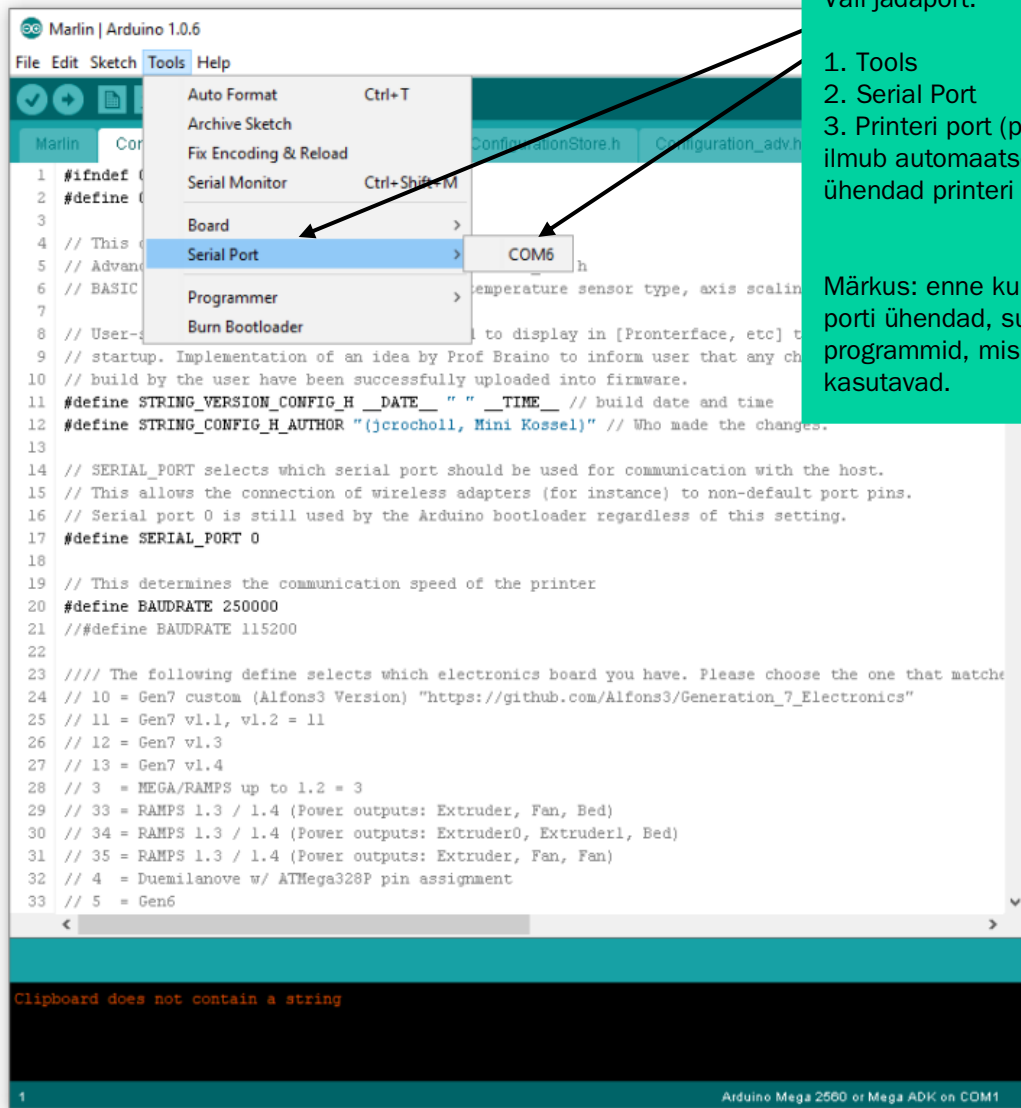


Liigu Cartesiuse 3D-lameprinteri koodikausta.

Ava fail nimega Repetier.







Vali jadaport.

1. Tools
2. Serial Port
3. Printeri port (pordinumber ilmub automaatselt, kui ühendad printeri USB-porti).

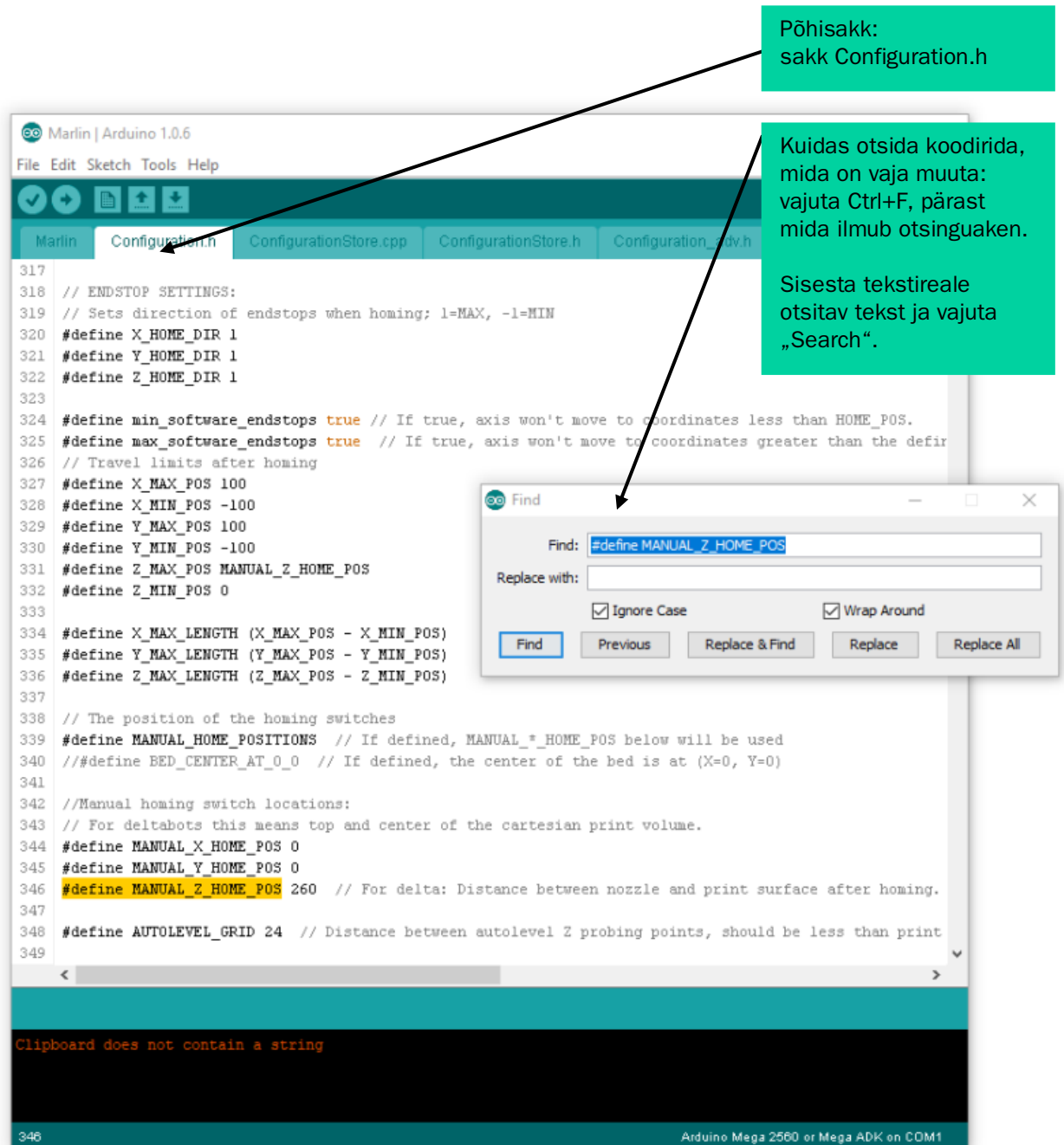
Märkus: enne kui printeri USB-porti ühendad, sulge teised programmid, mis printerit kasutavad.

2. Configuring and flashing firmware for the Flatbed Cartesian viscous materials 3D printer controller.

Põhisakk:
sakk Configuration.h

Kuidas otsida koodirida, mida on vaja muuta:
vajuta Ctrl+F, pärast mida ilmub otsinguaken.

Sisesta tekstireale otsitav tekst ja vajuta „Search“.



The image shows the Arduino IDE interface with the Configuration.h file open. The code is as follows:

```
317
318 // ENDSTOP SETTINGS:
319 // Sets direction of endstops when homing; 1=MAX, -1=MIN
320 #define X_HOME_DIR 1
321 #define Y_HOME_DIR 1
322 #define Z_HOME_DIR 1
323
324 #define min_software_endstops true // If true, axis won't move to coordinates less than HOME_POS.
325 #define max_software_endstops true // If true, axis won't move to coordinates greater than the defin
326 // Travel limits after homing
327 #define X_MAX_POS 100
328 #define X_MIN_POS -100
329 #define Y_MAX_POS 100
330 #define Y_MIN_POS -100
331 #define Z_MAX_POS MANUAL_Z_HOME_POS
332 #define Z_MIN_POS 0
333
334 #define X_MAX_LENGTH (X_MAX_POS - X_MIN_POS)
335 #define Y_MAX_LENGTH (Y_MAX_POS - Y_MIN_POS)
336 #define Z_MAX_LENGTH (Z_MAX_POS - Z_MIN_POS)
337
338 // The position of the homing switches
339 #define MANUAL_HOME_POSITIONS // If defined, MANUAL*_HOME_POS below will be used
340 //#define BED_CENTER_AT_0_0 // If defined, the center of the bed is at (X=0, Y=0)
341
342 //Manual homing switch locations:
343 // For deltabots this means top and center of the cartesian print volume.
344 #define MANUAL_X_HOME_POS 0
345 #define MANUAL_Y_HOME_POS 0
346 #define MANUAL_Z_HOME_POS 260 // For delta: Distance between nozzle and print surface after homing.
347
348 #define AUTOLEVEL_GRID 24 // Distance between autolevel Z probing points, should be less than print
349
```

The Find dialog box is open, showing the search term `#define MANUAL_Z_HOME_POS` and the `Replace with:` field. The `Find` button is highlighted.

Clipboard does not contain a string

348 Arduino Mega 2560 or Mega ADK on COM1

Cartesiuse 3D-lameprinteri Repetieri seaded sakist Configuration.h:

379	#define BAUDRATE 11520
40	#define MOTHERBOARD 33
65	#define DRIVE_SYSTEM 0
66	#define X_AXIS_STEPS_PER_MM 40
67	#define Y_AXIS_STEPS_PER_MM 53.3333
68	#define Z_AXIS_STEPS_PER_MM 2560 // 4571.4285
82	#define EXT0_STEPS_PER_MM 370
277	#define INVERT_X_DIR 0
278	#define INVERT_Y_DIR 0
279	#define INVERT_Z_DIR 0
280	#define X_HOME_DIR -1
281	#define Y_HOME_DIR -1
282	#define Z_HOME_DIR -1
283	#define X_MAX_LENGTH 500
284	#define Y_MAX_LENGTH 640
285	#define Z_MAX_LENGTH 200
286	#define X_MIN_POS 0
287	#define Y_MIN_POS 0
288	#define Z_MIN_POS 0

Cartesiuse 3D-lameprinteri Repetieri seaded sakist Configuration_adv.h:

213	#define DEFAULT_STEPPER_DEACTIVE_TIME 600 // ms
-----	---

Püsivara koodi printerisse laadimine

Salvesta

Koodi üles laadimine

Märkus

- Enne üles laadimist sulge teised printeriprogrammid.
- Kui kood on üles laaditud, ilmub alla vasakusse nurka selle kohta märg.

```
Marlin | Arduino 1.0.6
File Edit Sketch Tools Help
Marlin Configuration.h ConfigurationStore.cpp ConfigurationStore.h Configuration...

#define POWER_SUPPLY 1

//=====
//----- Delta Settings -----
//=====
// Enable DELTA kinematics
#define DELTA

// Make delta curves from many straight lines (linear interpolation).
// This is a trade-off between visible corners (not enough segments)
// and processor overload (too many expensive sqrt calls).
#define DELTA_SEGMENTS_PER_SECOND 100

// Center-to-center distance of the holes in the diagonal push rods.
#define DELTA_DIAGONAL_ROD 240.0 // mm

// Horizontal offset from middle of printer to smooth rod center.
#define DELTA_SMOOTH_ROD_OFFSET 177.5 // mm

// Horizontal offset of the universal joints on the end effector.
#define DELTA_EFFECTOR_OFFSET 28.34 // mm

// Horizontal offset of the universal joints on the carriages.
#define DELTA_CARRIAGE_OFFSET 21.0 // mm

// Effective horizontal distance bridged by diagonal push rods.
#define DELTA_RADIUS (DELTA_SMOOTH_ROD_OFFSET-DELTA_EFFECTOR_OFFSET-DELTA_CARRIAGE_OFFSET)

// Effective X/Y positions of the three vertical towers.
#define SIN_60 0.8660254037844386
#define COS_60 0.5

1 Arduino Uno on COM1
```

Printeri kontrollkoodid (allikas: marlinfw.org):

G0-G1: Linear Move	M82: E Absolute	M290: Babystep
G2-G3: Controlled Arc Move	M83: E Relative	M300: Play Tone
G4: Dwell	M85: Inactivity Shutdown	M301: Set Hotend PID
G5: Bézier cubic spline	M92: Set Axis Steps-per-unit	M302: Cold Extrude
G10: Retract	M100: Free Memory	M303: PID autotune
G11: Recover	M104: Set Hotend Temperature	M304: Set Bed PID
G12: Clean the Nozzle	M105: Report Temperatures	M350: Set micro-stepping
G20: Inch Units	M106: Set Fan Speed	M351: Set Microstep Pins
G21: Millimeter Units	M107: Fan Off	M355: Case Light Control
G26: Mesh Validation Pattern	M108: Break and Continue	M360: SCARA Theta A
G27: Park the nozzle	M109: Wait for Hotend Temperature	M361: SCARA Theta-B
G28: Auto Home	M110: Set Line Number	M362: SCARA Psi-A
G29: Mesh Bed Leveling	M111: Debug Level	M363: SCARA Psi-B
G29: Automatic Bed Leveling	M112: Emergency Stop	M364: SCARA Psi-C
G29: Unified Bed Leveling	M113: Host Keepalive	M380: Activate Solenoid
G30: Single Z-Probe	M114: Get Current Position	M381: Deactivate Solenoids
G31: Dock Sled	M115: Firmware Info	M400: Finish Moves
G32: Undock Sled	M117: Set LCD Message	M401: Deploy Probe
G33: Delta Auto Calibration	M118: Serial print	M402: Stow Probe
G38.2-G38.3: Probe target	M119: Endstop States	M404: Set Filament Diameter
G42: Move to mesh coordinate	M120: Enable Endstops	M405: Filament Width Sensor On
G90: Absolute Positioning	M121: Disable Endstops	M406: Filament Width Sensor Off
G91: Relative Positioning	M122: TMC Debugging	M407: Filament Width
G92: Set Position	M125: Park Head	M410: Quickstop
M0-M1: Unconditional stop	M126: Baricuda 1 Open	M420: Bed Leveling State
M3: Spindle CW / Laser On	M127: Baricuda 1 Close	M421: Set Mesh Value
M4: Spindle CCW / Laser On	M128: Baricuda 2 Open	M428: Home Offsets Here
M5: Spindle / Laser Off	M129: Baricuda 2 Close	M500: Save Settings
M17: Enable Steppers	M140: Set Bed Temperature	M501: Restore Settings
M18-M84: Disable steppers	M145: Set Material Preset	M502: Factory Reset
M20: List SD Card	M149: Set Temperature Units	M503: Report Settings
M21: Init SD card	M150: Set RGB(W) Color	M504: Validate EEPROM contents
M22: Release SD card	M155: Temperature Auto-Report	M540: Endstops Abort SD
M23: Select SD file	M163: Set Mix Factor	M600: Filament Change
M24: Start or Resume SD print	M164: Save Mix	M603: Configure Filament Change
M25: Pause SD print	M165: Set Mix	M605: Dual Nozzle Mode
M26: Set SD position	M190: Wait for Bed Temperature	M665: Delta Configuration
M27: Report SD print status	M200: Set Filament Diameter	M665: SCARA Configuration
M28: Start SD write	M201: Set Print Max Acceleration	M666: Set Delta endstop adjustments
M29: Stop SD write	M203: Set Max Feedrate	M666: Set dual endstop offsets
M30: Delete SD file	M204: Set Starting Acceleration	M851: Z Probe Offset
M31: Print time	M205: Set Advanced Settings	M852: Bed Skew Compensation
M32: Select and Start	M206: Set Home Offsets	M900: Linear Advance Factor
M33: Get Long Path	M207: Set Firmware Retraction	M906: TMC Motor Current
M34: SDCard Sorting	M208: Set Firmware Recovery	M907: Set Motor Current
M42: Set Pin State	M209: Set Auto Retract	M908: Set Trimptop Pins
M43: Debug Pins	M211: Software Endstops	M909: DAC Print Values
M43 T: Toggle Details (Debug Pins)	M218: Set Hotend Offset	M910: Commit DAC to EEPROM
M48: Probe Accuracy Test	M220: Set Feedrate Percentage	M911: TMC OT Pre-Warn Condition
M73: Set Print Progress	M221: Set Flow Percentage	M912: Clear TMC OT Pre-Warn
M75: Start Print Job	M226: Wait for Pin State	M913: Set Hybrid Threshold Speed
M76: Pause Print Job	M240: Trigger Camera	M914: TMC Bump Sensitivity
M77: Stop Print Job	M250: LCD Contrast	M915: TMC Z axis calibration
M78: Print Job Stats	M260: I2C Send	M928: Start SD Logging
M80: Power On	M261: I2C Request	M999: STOP Restart
M81: Power Off	M280: Servo Position	

Valminud Hariduse Infotehnoloogia Sihtasutuse IT Akadeemia programmi toel.



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Koostanud **Madis Kaasik ja Lauri Kilusk, Eesti Kunstiakadeemia**, jaanuar 2021