Flsun



Kossel 3D printer

User's Guide

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(1)Basics

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1,Install and connect

1) need software as follows:

A: repetier, it's the PC software to control the printer, slice and print the

Model

B: arduino, it's the working environment of the firmware(marlin)

C: marlin, it's the firmware, you need flash it to motherboard when you

Reset the height of the machine

D: others, you would need the other file like drivers, streamline etc,

When your PC cant recognize the board through USB

2)Connect the kossel mini USB port(arduino mega 2560), in device

Device manager, verify the COM port number assigned for the arduino

Mega 2560(eg.com15) as follow shown



If your PC could not connect the motherboard, need a step to install the driver:

Unzip the "driver" in the software file, and install the file"dpinst-amd64" if your PC is 64 bit; or install the file"dpinst-x86"if your PC is 32 bit, all in all, ensure you could find the "arduino mega 2560" port in the device manager

3)install "repetier" in your PC, the software of "repetier" has been packaged in the SD card, you could install from there or download from the internet(https://www.repetier.com/)

4)the other software of marlin and arduino only be used when you reset the height of the machine, so it is need not for the first print 5)The height of the machine has be set already when it is out off the factory, the highest position is decided by the limit switch block, we have determine it's exact position by the board fix item like the pic1, and the lowest position is decided by the USB interface like the pic2, finally the print height of the machine is determined by the two position, it is 285mm from the highest to the lowest





If you want DIY your printer's height by yourself, you could change the limit switch block's position to rise or reduce it's height, and you have to reset the height's value in the marlin, you could refer to the chapter 5

2, level the bed and auto-leveling

(1)test the function of repetier

1): install the repetier in your PC;



2): run repetier

language



Connect



Communication Port

fincer.	default			 ★
onnection	Printer	Extruder	Printer Shape Advance	a
Connector:	Seri	l Connec	tion 👻	
Port:		COM15		set the kossel
Daga var	e.	250000	-	nort com1E
Transfer Protocol:		Autode	etect 👻	port comits
Reset on	Connect	DTR 1	ow->high->low	•
Reset on	Emergency	Send o	emergency command and re	connect 👻
Receive	Cache Size	: 127		
11 P	in m Pan - C	100000000000000000000000000000000000000	in (Sand only often als	Ϋ́
The prin are stor printer selected	nter setti: ed with ev name and j l	ommunican ngs alway rery OK o ress app	s correspond to the sele r apply. To create a new ly. The new printer star	, cted printer at the top. They printer, just enter a new ts with the last settings

3): printer settings

printer type:rostock printer(circular print hap)

🔃 Repetier-	-Host V1.0.6						
File Vie	w Config Prin	iter Tools He	elp	1	٢		¢°
Disconnect	Load Save	Print Start Print	Kill Print	Toggle Log	Show Filamen	t Print	er Settings
3D Vie Prin	nter Settings				Real Proven		iew Man
C Pri Co Pr Tr Tr Tr Pr Tr Tr Tr Tr Tr Tr Tr Tr Tr T	inter: defaul nnection Printer inter Type: F ome A. Mi C -intable Radit: C -intable Radit:	t Extruden Printe ostock Frinter (c lassic Printer (w ostock Printer (c NC Kouter 100 340	er Shape td ircular prin ith dump are ircular prin mm	vanced nt sha v sa) st shape)	Min		

Home X min; hone Y min; home Z max

Connection Printer Extruder Printer Shape Advanced Printer Type: Rostock Printer (circuler print she 💌 Home X: Min 🗣 Home Y: Min 🗣 Home Z: Max	
Printer Type: Rostock Printer (circuler print she 💌 Home X: Min 🔷 Home Y: Min 🗣 Home Z: Max	
Home X: Min → Home Y: Min → Home Z: Max	
	-
Frintable Kadius: 135 mm	
Printable Height: 340 mm	

4):home function



CODE: G28 or GUI:

Easy mode then input g28 and send



Then the three axis's pulley will go up to the top until hit the switch



5)Control panel



6)Extrude and reverse

Type m302 before use this function





7)Move nozzle at x y and z axis







8)Preheat hotend

Control panel: adjust from there

ETA	Bed Tempera re	27 40°C	55 🔺	[Caution]
	Extr. der 1	27.40°C	200	
Debug	dotions	-		

Check from there(bottom of repetier)

Show in Log:	Commands	OInfos	OWarnings	OErrors	●ACK	OAuto Scroll	🕋 Clear Log	Copy
10:06:21.58	5 End file	e list			-		-	-
10:06:21.95	5 echo:Act	tive Extr	uder: 0					
Connected: default			Extr	uder: 27.	3°C/Off Bed: 27.4°	C/Off		

Temperature curve

-				·				
C) . [1. 🔛		-		۲	<	۲
Discon	nnect Lo	ad Save Prir	t Start Print	Kill Print	Toggle Log	Show Filar	ment Show	v Travel
3D Vie	ew Tempera	ture Curve						
Tem	nperature	Timeperiod	Zoom Bui	d Average o	over Cor	ntinuous <mark>Mo</mark> i	nitoring	
		Show Extruder	Pas	st 60 Mi	nutes			
35 -		Incet		14				• 35
30 .	V	Output Extruder		and the second	dil marte	And Alexander		30
25	· · · · · ·	output beu	The second		a series and	2.85.098.0	*	- 25
20								- 20
15				-				15
15				Ĩ				15
10 •				-			-	- 10
5 -	-							- 5
0.								0
100	5 5	15:00		20:00		25	5:00	100
100	Output Ex	ctruder		86			e.	100
50	_						_	50
0		15:00		20-00		20	:00	0
100		15.00		20.00		2:	5.00	100
	Output Be	ed						
50								50
100.05								
0		15:00		20:00		25	5:00	0

9)Info of operation



Check at the bottom

Show The Log.	Commands	OInfos	O₩arnings	OErrors	OACK	OAuto Scroll	💼 Clear Log	Сору
10:06:21.99	55 echo:Act	tive Extr	uder: 0					

10)Info of coordination

MCODE: type m114 then check at the bottom



11)Info of limit switch

MCODE: type m119 then check at the bottom



Observation: x_max, y_max, z_max, z_min

Hit the switch= triggered

Not hit switch= open

(2)level the bed

1): input g1 z0 : the nozzle will goes down to the position which is very

close to bottom plate



- 2) adjust the springs to ensure the plate is leveled at three coordination
- A: g1 x0 y-60 z0;
- B: g1 x50 y30 z0;
- C: g1 x-50 y30 z0;



A point:



adjust the screw, ensure the bed nearly touch the nozzle(there should be a gap of a paper between the nozzle and the bed)





The same method at B and C points then the bed would be leveled enough

(3)Auto-leveling

1) home the nozzle

2) then do the auto-leveling by input g29



Then the nozzle will goes down and touch the plate by 9 points



It is the process of auto-leveling

3,steps of printing

(1)Settings

1): open repetier >settings >printer shap >rostock printer(circular

print hap)

Printer Settings					Printer Settings	EASY Easy Mode Emerg
Printer: defaul	t	-	•		cer lifeview mandat	Source Sp card
Connection Printer	Extruder Printer Sha	Pe Advanced				
Printer Type: R	ostock Printer (circul	ar print sha 🔻	-			
Home X: Min	➡ Home Y: Min	➡ Home Z:	Max 🔻			2
		Ref.	,		0.00 Z	0.00 Extruder
Printable Radius:	135	mm				
Printable Height:	340	mm		× ×		
					000	46

2): repetier >connect >select port

Repetier-Host V1.0.6		A there		
onnect Load Save	Printer Tools Help	p Il Print Toggle Log Sho	w Filament Show Tra	avel
Prin	ter Settings			
C	default			
↔ C•	nnection Printer Ext	truder Printer Shape Ad	vanced	
	onnector: Serial (Connection 👻		
+	Port:	EOM15	1	
Q -	Baud Kate:	COM1		
0	Transfer Protocol:	COM15 Autodetect 🗸		
	Reset on Connect	DTR low->high->low		-
	Reset on Emergency	Send emergency command a	nd reconnect	•
	Receive Cache Size:	127		
	🔲 Use Ping-Pong Comm	nunication (Send only aft	er ok)	

(2)prepare

1): load 2): slice Slice with Slic3r

3): preview



4): preheat the nozzle to 210 degree(click the red marked)



(3)Start print

1): start print (do this step after the temp rise to 210 degree)



2): the machine will finish the model by itself



notice



4, Repetier



(1)Basics



repetier screen after Input code



11)slicer>configuration; change the settings of the printer

Object Placemen	Slicer	review	Manual Control	SD Card	
Slic	e wit	h Sli	c3r	Kill Slicing	
Slicer: Slic3	r		•	© Manager	
			0	Configuration	
Print Setting:	t Setting: Untitled				
	ar				

Slice with Slic3r 12) slice with slic3r ; slice before start print 13)preview >G-Code Editor >save 📕 ;save the code to SD Card Drinton Sottings Easy Mode Emergency Stop Preview anual Control SD Card Object Placement Slice G-Code Editor Preview 🔀 🛍 🖻 🖯 🖓 G-Code generated by Slic3r 1.1.7 on 2016-08-06 at ; perimeters extrusion width = 0.40mm ; infill extrusion width = 0.42mm ; solid infill extrusion width = 0.42mm ; top infill extrusion width = 0.42mm G21 ; set units to millimeters M107 10 M104 S210 ; set temperature 11 G28 ; home all axes 12 G1 Z5 F5000 ; lift nozzle 13 14 M109 S210 ; wait for temperature to be reached 14)manual control> ;move x and y axis 15)manual control > 🛋 ; move the z axis 16)Manual control 200 1 Extruder 1 57.10°C 1 heat nozzle by click

(2)Settings

1) Slice >configuration >print settings >layers and perimeters >layer

height:0.35mm/first layer height:0.4mm then save the settings

2)Print settings>infill >fill density: 40%/fill pattern:rectilinear/top,bottom

fill pattern:rectilinear >advanced >solid infill every: 1 layer, then save

3) Filament settings >filament >diameter:1.75mm then save it

4)Printer settings >extruder 1 >nozzle diameter:0.4mm then save it

5)Printer settings >retraction >length:5mm/speed:30mm/minimum travel after retraction:2mm then save it

💈 Slic3r 🛛 🖂							
File Window Help							
Print Settings Filament Settings P	rinter Settings						
Untitled (modified) 🔻 📄 🥥	Layer height						
Lavers and perimeters	Layer height:	0.3	mm				
	First layer height:	0.4	mm or %				
🕑 Speed							
Skirt and brim	Vertical shells						
🔜 Support material	Perimeters (minimum):	3	* *				
Output options	Spiral vase:						
P Multiple Extruders	Horizontal shells						
	Solid layers:	Тор: 3	* Bottom: 3	*			
	Quality (slower slicing)						
	Extra perimeters if needed:						
	Avoid crossing perimeters (slow):						
	Detect thin walls:						
	Detect bridging perimeters.						
	Advanced						
	Seam position:	Aligned 👻					
	External perimeters first:						
	1	Ш		•			
Version 1.1.7 - Remember to check f	for updates at http://slic3r.org/						

itled (modified) 🔹 📄	Infill		
Lavers and perimeters Infill	Fill density: Fill pattern:	30 ✔ % rectilinear	•
speed Skirt and brim	Top/bottom fill pattern:	rectilinear	-
Support material Notes	Reducing printing time		
Output options	Combine infill every:	1 a	ayers
Multiple Extruders Advanced	Only infill where needed:		
	Advanced		
	Solid infill every:	0	ayers
	Fill angle:	45 •	
	Solid infill threshold area:	70 mm²	2
	Only retract when crossing perimeters:		
	Infill before perimeters:		
	25		

Slic3r	-			
Print Settings Filament Settings	Printer Settings			
Untitled 🗾 🤤	Filament			
S Filament	Diameter:	1.75	mm	
Cooling	Extrusion multiplier:	1		
	Temperature (°C)			
	Extruder:	First layer: 210)	Other layers: 210
	Bed:	First layer: 0		Other layers: 0

rint Settings Filament Setting	Printer Settings			
ntitled 🔹 📄 🤤	Size Nozzle diameter:	0.4	m	ım
Extruder 1	Position (for mana-extrader printe Extruder offset:	x: 0	y: 0 r	nm
	Retraction			
	Length:	6	m	im (zero to disable)
	Lift Z:	0	m	ım
	Speed:	30		mm/s
	Extra length on restart:	0	m	im
	Minimum travel after retraction:	2	m	im
	Retract on layer change:			
	Wipe while retracting:			
	Retraction when tool is disabled	(advanced s	settings fo	or multi-extruder setups)-
	Length:	10	m	ım (zero to disable)
	Extra length on restart:	0	m	im

5,Marlin

(1) Arduino

the Arduino is an environment for marlin, only when install the arduino could the marlin be opened, and remember don't change any

parameters of it



(2) Marlin

1) install the marlin

🔾 🗸 🖡 h mks	► Software ►	- - - - + + + + + + + + + +	
文件(E) 编辑(E) 查	昏(⊻) 工具(I) 帮助(出)		
组织 ▼ 包含到库	中▼ 共享▼ 新建文件夹		
☆ 收藏夹	▲ 名称 [▲]	修改日期	类
🚺 下载	💿 arduino-1.6.1-windows	2015/4/23 3:23	应
三 桌面	arduino-1.6.1-windows	2016/6/27 16:26	供
🗐 最近访问的位置			仗
	🛃 Marlin	2016/7/29 9:07	快
唐	Printrun-Win-Silc3r-03Feb2015	2015/4/25 5:22	快
	≡ 👘 setupRepetierHost_1_0_6	2014/10/20 17:38	应
	setupRepetierHost_1_0_6	2016/7/29 9:07	快
	Solve streamline Version Windows 7,	2015/12/17 20:57	仗

Run the "marlin"

	10 T 10	The second secon	
🚱 🔾 🗢 📕 🕨 mks 🕨	Marlin	- ↓	搜索 Mar.
文件(E) 编辑(E) 查看(V)	工具(工) 帮助(出)		
组织 🔻 🗖 打开	共享 ▼ 新建文件夹		
	名称 	修改日期	<u> </u>
人 下載	dogm_font_data_marlin.h	2015/4/21 17:06	H 文件
·····································	DOGMbitmaps.h	2015/4/21 17:06	H文件
	📄 fastio.h	2015/4/21 17:06 2015/4/21 17:06	H 文件 H 文件
□ 単	LCD_Menu_Tree	2015/4/21 17:06	WPS PDF 3
	LiquidCrystalRus.cpp	2015/4/21 17:06 2015/4/21 17:06	CPP 文件 H 文件
	Makefile	类型: H 文件	文件
→ 音乐	🖂 Marlin	修订用: 2015/4/21 17:06	H 文件 Arduino fil
▮ 计算机	Marlin_main.cpp	2015/4/21 17:06	CPP 文件
A Win 7 Hit v64 ((MarlinSerial h	2015/4/21 17:06	日文性



Notice: It's shortcut is similar to Arduino, don't mistake them

2)settings

Go to tools > board >arduino mega 2560

Go to tools > port, select the COM port

Go to tools > programmers > USBtinyISP







Firmware could only be upload succeed when it's settings like the above

- (3)Calibrating Height
- 1)Open the marlin /Configuration.h



Editor > search



Search for "#define MANUAL_Z_HOME_POS"

🧙 寻找 :	
寻找:	#define MANVAL_Z_HOME_POS
替换为:	 ⑦ 忽略大小写 ⑦ 环绕 Search □ 搜索に向下所有文件
寻找:	前一个

//Manual homing switch locations: // For deltabots this means top and center of the cart: #define MANUAL_X_HOME_POS 0 #define MANUAL_Z_HOME_POS 270//306.6 // For delta: Dist //Because there will be differences for each machine in

Notice: 270 is the height of the machine

Replace it with 310

//Manual homing switch locations: // For deltabots this means top and center of the #define MANUAL_X_HOME_POS 0 #define MANUAL_Z_HOME_POS 310//306.6 // For delta //Because there will be differences for each mach:

Then upload

文件 编辑	项目工具帮	助		
00				<u>@</u>
Marlin	BlinkM.cpp	BlinkM.h	Configuration.h	ConfigurationStore.
#ifndef #define	CONFIGURATIO CONFIGURATIO	N_H N_H		-

💿 Marlin	Arduino 1.6.1			
文件 编辑	项目 工具 帮	助		
0 🔸				P.
Marlin	BlinkM.cpp	BlinkM.h	Configuration.h	ConfigurationStore.
#defin	ae NONLINEAR_BE	D_LEVELING		*
#endif				
#endif	9. S. 1915	- 91 - 19 - <u>2</u>		H
// The pos #dafina MA ∢	SITION OF THE F STRING HOME POST	ioming switch דדהאק // דו	tes F defined MANDER	HOME POS helow with the
正在编译项	i=		(E	_
391		Arduino Mega c	or Mega 2560, ATmega	2560 (Mega 2560) on COM3





When it read finished, the upload is succeed.

Connect repetier to your PC

🜒 Repetier-Host V1.0.6	A Constitution of the Constitution of the	
Income v Config Printer Tools	Help Kill Print Toggle Log Show Filament Show Trave	4
Printer Settings		
C defau	lt ·	- a
Connection Printer	Extruder Printer Shape Advanced	
Lonnector: Ser	ial Connection 👻	
Port:	EOA15	
🚭 Baud Kate:	COM1	
Transfer Protoco	1: COM15 Autodetect	
Reset on Connect	DTR low->high->low	•
Reset on Emergen	cy Send emergency command and reconnect	•
Receive Cache Si	ze: 127	
Use Ping-Pong	Communication (Send only after ok)	

Set the shape of the bottom of the plate /rostock printer(circular print

hap)





Home the axis's pulley(input g28 on the Manual Control)



All axis will go up to the top position after that



Type m114 to check the Z axis's coordination



As you could see The Z axis is 310mm at this time (record as A)

Type"g1 z40" to let the nozzle down to the position higher than the plate about 20cm



Then Down the nozzle close to the plate manually by 10mm, then down 1mm every steps until it nearly touch the plate, (put a A4 paper between the nozzle and the plate) down the nozzle by 0.1mm carefully until the nozzle touch the paper would be OK





There should be a A4 paper gap between the nozzle and the plate at this

time

Input m114 to check the coordination of Z axis again



The height of the nozzle is 11.4mm at this time (record as B)

The right height of the machine could be figure out with A and B:

right height = A - B

310mm-11.4mm=298.6mm

Disconnect repetier and open marlin

/Configuration.h



editor—search: #define MANUAL_Z_HOME_POS

//Manual homing switch locations: // For deltabots this means top and center of #define MANUAL_X_HOME_POS 0 #define MANUAL_Y_HOME_POS 0 #define MANUAL_Z_HOME_POS 310//306.6 // For de //Because there will be differences for each m

replace 350 with 298.6 then upload



6, LCD



(1)Basics

1)button 1: twist to select option, click to enter

2)button 2:click to reset

(2)Print off line

1)insert the SD Card to LCD >click button

2)control >temperature >nozzle >200

3) prepare >preheat PLA

(3)print from SD card >select the g-code file



7 ,Safety and Handling



2) remember preheat the nozzle to 200 degree before you start print

8, Tips and Troubleshooting

(1)General Suggestions

1) ensure the wire plug the right socket on the board, especially the temp

sensor, ensure it is tight enough



2)the suitable temp for PLA is 200-210; for ABS is 240-250; for hotbed is 80

- (2) Uploading Firmware
- 1) If you could not find the Mega2560 in the device manager, try to

install the driver amd64 (you could find the drivers in the SD Card,

If your PC is 32bit, pls install x86)

2)If the "driver amd64" can not works, open the file-"solve streamline version windows7...", then copy the file as the 章宏装说明 said
3) if the all the above doesn't works, maybe you installed arduino/marlin into C disk, try with D disk or others
4) if the repeteir cant connect, replug the USB wire again

(3)Operating printer

You need a multimeter



1) if you meet "MINTEMP", it is due to the temp sensor, plug it tightly enough, otherwise it maybe broken, measure it's resistance with a multimeter(the normal value is 100k)



2) if the "extruder motor doesn't move" with extruder button, pls input m302 before you do it

w Travel		Printer S	ö ettings	Easy Mo	ode Em	ergency St	top
Object Placement	Slicer	Preview	Manual	Control	SD Card]	
1dle							ŕ
G-Code: m302	>					Send	
X 0.00	Y	0.00	Z	0.00	Extrude	er 1 🔻	
	Y		Z	3	~	3	E

3) if the "pulley can't go up" succeed with g28, it may due to the limit switch, input m119 and press the switch on/off to see whether the message is always "triggered" at the bottom of the repetier, or measure the output volt of the motor driver(normal value is 0.5v)



switch on

switch off

Show in Log:	Commands	OInfos	OWarnings	0	Show in Log: 🕻	Commands	OInfos	OWarnings
17:15:21.55	1 X:0.00	Y:0.00 Z:1	11.00 E:0.00	Cc	16:36:23.879	X:0.00	Y:0.00 Z:	11.00 E:0.00
17:15:26.34	8 Report:	ing endstop	status		17:14:42.268	Reporti	ng endsto	p status
17:15:26.35	1 x_max:	TRIGGERED			17:14:42.269	x max:	open	S OVER AND A
17:15:26.35	2 y_max:	TRIGGERED			17:14:42.269	y max:	open	
17:15:26.35	2 z_min:	open	24.		17:14:42.269	z min:	open	
17:15:26.35	2 z_max:	TRIGGERED			17:14:42.269	z_max:	open	
	× 1							

switch on

switch off



4)if the "filament cant extruded" smoothly, check the extruder motor parts, ensure there exist no stuck with the part1 and part2 in the picture; and assemble filament into nozzle by hand carefully to see whether it could came out in this case, otherwise replace the nozzle with a new one.



5)if the LCD can not show the value normal pls upload the firmware(marlin) again with the LCD disconnected or click the reset button, or maybe you have mistake the two wire of the LCD



9,Learning more

(1)More Information

Repetier: https://www.repetier.com/

Slice: http://slic3r.org/

Cura: https://ultimaker.com/en/products/cura-software

Marlin: https://github.com/ErikZalm/Marlin

Arduino: https://www.arduino.cc/