

Z offset calibration

Note: this procedure has to be done with the front door always close.

It is recommended to make this procedure using a computer.

To operate your Macro PU from your computer or smartphone, please open a web browser, such as Chrome, and in the navigation bar type the following link:

PU-LT-[Unit Serial Number].local/

New Tab	×	+	
$\leftarrow \rightarrow G \nabla$	OPU-LT-1630.	.local/	

The Unit serial number is included on the model identification tag located on the rear panel of the unit next to the power socket and on your Macro PU touchscreen.

SMAR13D www.smart3d.tech	Status Idle Mode: FFF Tool X Y Z	Tool Heater Current Activ
A Warning:	Extruder Drive 0 Drive 1 Drives 494.0 0.0	Tool 0 Heater T0 - Load 1 22.5 C 0 Filament active
1. Inis apparatus must be properly grounded. 2. Do not power unless all service panels are in place. 3. Disconnect power before servicing or cleaning.	Requested Top Speeds Speed Speed	Ti-Load 2 22.3 C 0 Filament off
etice: This device complies with part 15 of the FCC Rules. peration is subject to the following two conditions: (1) This evice may not cause harmful interference, and (2) this device ust accept any interference received, including interference at may cause undesired operation.	Vin V12 24.0 V 12.1 V Sensors 42.2 C 2-Probe 0	Chamber 0 24.1 C 0
odel: Macro PU	Printed purge.gcode, 100 % comple	ete
10 V a.c. 50/60 Hz 1900 W	V Layer Chart	
IO V a.c. 50/60 Hz 1900 W eveloped by Industry Supplies. Inc. E, USA. ade in Argentina.	1/ Layer Chart 305 255 203 155 105	
0 V a.c. 50/60 Hz 1900 W eveloped by industry Supplies, Inc. 2 USA ade in Argentina.	 ✓ Layer Chart 205 205 105 105 05 	
0 V a.c. 50/60 Hz 1900 W welcoed by industry Supplies. Inc. USA ode in Argentina.		Estimations based on Filament File Layer Usage Progress Time n'a n'a n'a

Once you have opened the address link, you will access the command screen of your Macro PU via your computer.

≡	PU-L	T-1630	Ser	nd code		> SEND			AD & START	F EMERGENCY STOP
畦	Contro	bl	^	Status	Printing Mode: F	FFF 🔍 Tool	s + Extra	- Cont	trol Heaters	M Temperature Chart
	55	Dashboard	- 1	Tool Position	X Y 1.0 170.1 1 ⁻	Z Tool 1.00 Tool 0	Heater Current	Active	Standby	Heater 0 Heater 1
	<>	Console	- 1	Extruder	Drive 0 Drive	e 1 Filament	active 47.7 °C	0 •	0 -	450-400-
	⊞	Height Map		Speeds	Requested Top Sp Speed 0 mm	peed T1 - Load m/s Filament	Heater 2 standby 49.4 °C	0 *	0 -	350
•	Job		^		0 mm/s	Chamber	Heater 0 active 55.1 °C	55 👻	0 -	200
	0	Status		Sensors	24.0 V 12.1 MCU Temperature	z-				100
	30	G-Code Viewer			30.8 °C P	robe 0				$\begin{matrix} 0 \\ & & $
	Files		^	Printing test_A	BS.gcode, 99.3 % cor	mplete		F	Filament Usage:	: 6385.0 mm (4.1 mm remaining)
	•))	Filaments								
	►	Jobs		🔧 Job Cont	rol	₽ Layer Chart			Ø Spec	ed Factor
	/^	Macros		PAU	SE PRINT	30s			- -	+

For doing the calibration of the Z offset follow this instructions;

NOTE: Before starting the calibration process, please clean the nozzle and the build plate from any debris, check that the building platform is in place, and that the build plate is well calibrated by following the corresponding procedure.

 Press the Dashboard button situated on the left side of your screen and then press HOME ALL. The Macro PU will sense Y axis, X axis and finally Z axis. Wait until the procedure finishes. The nozzle will rest in the left rear corner of the build plate.

=	duet	3	Send c	ode			- >	SEND			🚹 UPLO	AD & ST	ART	🕴 EN	IERGENCY S	тор
蒜	Contro	bl	^	Extruder	Drive 0	Drive	1	T0 - Load Filament	leater 1 3 active	95.0 C 3	95 👻	315	*	450	Heater 2	
	8	Dashboard		Speeds	Requested	Top Spe	eed /s	Tool 1 T1 - Load Filament	Heater 2 off	9.4 C C	•	0	•	350 300		
	<>	Console			6 mm/s Vin	V12		Chamber	leater 0 active	20.1 C 1	20 👻	0	•	250 200 150		
_	▦	Height Map		Sensors	23.7 V MCU Tempera 45.7 C	12.1) ature 2 Pr	V Z-							100 50		=
•	Job	01-1-1-	^				0							12.22		10. 12 00. 12 00. 12
	30	G-Code Viewer		HOME ALL		Machine	Moveme	ent	СОМР	ENSATIO	N & CALIBR	ATION 🔻		🐼 Mac	ros	Root
	Files		~	HOME X	< X-50	< X-10	< X-1	< X-0.1	X+0.1 >	X+1 >	X+10 >	X+50 >)	0	Load_filament_	то
	۲	Filaments		HOME Z	< Z-25	< Z-5	< Z-0.5	< Z-0.05	Z+0.05	> Z+0.5	> Z+5 >	Z+25 X	>	0	Load_filament_	T1
	•	Jobs												0	Load_PEEK	
	\$	Macros	-	Extrusion Feed amount	Control in mm:			Feedr	ate in mm/s	3:				0	Unload_filamen	t_T0

≡	duet	3	Send	d code	> SEND	UPLOAD & START	EMERGENCY STOP
畦	Contro	bl	^ Î	 Status 	Idle Mode: FFF 🔍 Tools + Extra	- Control Heaters	🔊 Temperature Chart
	8	Dashboard		Tool Position	X Y Z Tool Heater Current 1.0 170.1 11.00 Tool 0 Heater 1	Active Standby	Heater 0 Heater 1
	<>	Console		Extruder Drives	Drive 0 Drive 1 T0 - Load 30.0 °C 0 6385.0 0.0 - - - -		450 400
	⊞	Height Map		Speeds	Icol 1 Heater 2 Requested Top Speed T1 - Load Speed 0 mm/s Filament	0 0	350
ē	Job		^		0 mm/s Chamber Heater 0 active 32.5 °C) • 0 •	200-
	0	Status		Sensors	Vin V12 24.0 V 12.1 V MCU Temperature Z-	120	100
	3D	G-Code Viewer			29.9 °C Probe 0	115	0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	Files		^	HOMEALL		110	(A Macros Root
	0))	Filaments				105	
	►	Jobs		HOME Y	< Y-50	100 Y 1 00	Load_filament_T0
	/^	Macroe		HOME 7		> > >	Load_filament_T1

2. Start heating the Chamber about 100 degrees, by pressing the arrow button as shown.

3. Once the temperature has been reached, to disable the bed compensation type the command **M561** in the upper command bar and press **SEND**.

≡	duet:	3		M561								6	UPLOAD & ST	ART F EMERGENCY	STOP
莊	Contro	bl	^	Sensor	rs N	ACU Tem 27.7	perature Z- °C	Probe 0						0 	5.6.5°
	5	Dashboard													
	$\langle \rangle$	Console		номе	ALL		₊⁺ Mac	hine Move	ment	_	COMPENSATI	ION & CALIB	RATION -	Macros	Root
	⊞	Height Map	. 1	ном	EX	< X-5	0 < X-10	< X-1		X+0.1 >	X+1 >	X+10 >	X+50 >	Load_filament_T	D
	m	. reight map	. 1	ном	IE Y	< Y-5	0 < Y-10	< Y-1	≮ Y-0.1	Y+0.1 >	Y+1 >	Y+10 >	Y+50 >	Load_filament_T	1
ð	Job		^	ном	IE Z	< Z-2	5 < Z-5	< Z-0.5	≮ Z-0.05	Z+0.05 >	Z+0.5 >	Z+5 >	Z+25 >	~	
	0	Status	- 1	_										Load_PEEK	
	3D	G-Code Viewer			usion (Control mm:		Fe	eedrate in mr	n/s:		+	RETRACT	Unload_filament_	.TO
	Files		^	100	50	20	10 5	1	60 30	15	5 1	+	EXTRUDE	Unload_filament_	_T1
	0))	Filaments		_										Unload_PEEK	
	۲	Jobs	Ţ	∳ Fan Fan Sele	Contro ection:	bl	6								

4. Type the following command **M564 S0**, so the Unit allow you to move further Z0.

=	duet3	M564 S0	•	> SEND	
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5. To pass to relative motion, write on the command bar G91.

\equiv	duet3	G91	> SEND

6. Now move the hotend 7mm left and 29mm forward, by typing the command G1 X-7 Y-29.



Rise the build plate by pressing the button Z-5 once, and Z-0.05 till you see that the nozzle touch the build. Press Z+0.05 tow times for giving an offset of 0,1mm between the nozzle and the build plate.

Press **Z+0.05** to lower the build plate if you need.

Note: remember to move slowly up and down, so the nozzle doesn't crash violently with the build plate.

HOME ALL		,≓ Mach	ine Moven	C	OMPENSATI	ON & CALIBE	RATION 🛨	
номе х	< X-50	< X-10	∢ X-1	≮ X-0.1	X+0.1 >	X+1 >	X+10 >	X+50 >
НОМЕ Ү	< Y-50	< Y-10	〈 Y-1	< Y-0.1	Y+0.1 >	Y+1 >	Y+10 >	Y+50 >
HOME Z	< Z-25	< Z-5	≮ Z-0.5	< Z-0.05	Z+0.05 >	Z+0.5 >	Z+5 >	Z+25 >

8. Once your nozzle is touching the build plate, we are going to make an artificial home Z by typing the command G92 Z0 in the upper command bar and pressing SEND. The Macro PU will think that at this point is the Z0.

≡	duet3	G92 Z0	> SEND	

9. Lower the build plate by pressing the button **Z+5** or by typing the command **G1 Z5** in the upper command bar and pressing **SEND**.

HOME ALL	E ALL Machine Movement COMPENSATION & CALIBRATION						ATION 🔻	
номе х	< X-50	∢ X-10	∢ X-1	∢ X-0.1	X+0.1 >	X+1 >	X+10 >	X+50 >
номе у	< Y-50	< Y-10	∢ Y-1	∢ Y-0.1	Y+0.1 ≯	Y+1 >	Y+10 >	Y+50 >
номе z	< Z-25	< Z-5	< Z-0.5	≮ Z-0.05	Z+0.05 >	Z+0.5 >	Z+5 >	Z+25 >

Now move the hotend 7mm right and 29mm backwards, by typing the command G1 X+7
 Y+29.

≡	duet3	G1 X+7 Y+29	> SEND

11. Now, make the inductive sensor to sense its position relative to the build plate by typing the command **G30 S-1**

≡	duet3	G30 S-1	> SEND

12. Lower the build plate by pressing the button **Z+5**

HOME ALL	⊷ Machine Movement				COMPENSATION & CALIBRATION -			
номе х	< X-50	< X-10	∢ X-1	∢ X-0.1	X+0.1 >	X+1 >	X+10 >	X+50 >
номе у	< Y-50	< Y-10	〈 Y-1	〈 Y-0.1	Y+0.1 ≯	Y+1 >	Y+10 ≯	Y+50 >
номе z	≮ Z-25	< Z-5	≮ Z-0.5	< Z-0.05	Z+0.05 >	Z+0.5 >	Z+5 >	Z+25 >

- **13.** Repeat the last two steps 4 more times.
- **14.** The sensed data, that the inductor has measure will be displayed in Console, take an average of this collected data



=	duet3		Send code > SEND	UPLOAD & S	START F EMERGENCY STOP
	Control	~	Sensors MCU Temperature Z-Probe 28.7 °C 0		
•	Job	~			
	Files	^	System Directory -	C REFRESH	• UPLOAD SYSTEM FILES
	 Filaments 	- 1	☐ Filename ↑	Size	Last modified
	C Hamono	- 1	bed.g	361 B	24/5/2021 15:53:55
	 Jobs 	- 1	Config-override.g	563 B	27/6/2021 17:12:36
	Macros	_	C Config.g	5.6 KiB	29/6/2021 13:38:04
	System		Config.g.bak	6.0 KiB	27/6/2021 17:12:51
٩	Settings	^	Config.json C edit via config tool	3.4 KIB	24/5/2021 15:53:56
	표는 General	- 1	dwc-settings.json	2.3 KiB	17/6/2021 16:38:52
			dwc2settings.json	3.1 KiB	24/5/2021 15:53:56
ţ,	🚓 Machine-Spec	TIC .	heidhtmap.csv	1.0 KiB	25/6/2021 16:28:35

Go to **System** and find the file call **config-overryde.g**, open it by making double click on it.

Replace the custom Z offset by the average you have take, and press **save**.

×	C 0:/sys/config-override.g	? G-CODE REFERENCE	💾 SAVE
1	; config-override.g file generated in response to M500 at 2021-05-15 15:26		
2			
З	; Heater model parameters		
4	M307 H0 R0.092 C284.700:284.700 D3.50 51.00 V23.9 B0		
5	M307 H1 R2.574 C255.600:255.600 D5.80 S0.90 V23.9 B0		
6	M307 H2 R2.429 C140.000:140.000 D5.50 51.00 V0.0 B0		
7	; Workplace coordinates		
8	G10 L2 P1 X0.00 Y0.00 Z0.00		
9	G10 L2 P2 X0.00 Y0.00 Z0.00		
10	G10 L2 P3 X0.00 Y0.00 Z0.00		
11	G10 L2 P4 X0.00 Y0.00 Z0.00		
12	G10 L2 P5 X0.00 Y0.00 Z0.00		
13	G10 L2 P6 X0.00 Y0.00 Z0.00		
14	G10 L2 P7 X0.00 Y0.00 Z0.00		
15	G10 L2 P8 X0.00 Y0.00 Z0.00		
16	G10 L2 P9 X0.00 Y0.00 Z0.00		
17			
18	; CUSTOM OFFSET		
19	G31 Z0.75		
20			

15. To finish this procedure, restart the printer.

Nota: To pass again to absolute values type the command G90 in the upper command bar and press SEND.