

Quick user guide for the “DM dispenser”

READ FIRST!

- Use the shortest/thickest USB cable possible, if the screen dims too much during operation (to the point where it's hard to read the text) your cable or power supply is inadequate and may cause instability.
- If you're powering the device with the DC power jack make sure it's **5V DC center positive**. Don't trust the label, check with a multimeter to be certain.
It can also be powered with a 12-24V supply but only after doing some modifications inside, read the user guide online for the specific details. By default it will only work with 5V supplies.
- For best results use with low viscosity pastes. Solder pastes that come in small ready to use syringes are the safest bet. If it comes in a jar is likely to be higher viscosity for stencil printing purposes, although adding liquid flux can help to thin it down in most cases.
- When using the dispenser in the pick up mode, piston lubrication is required. Very simple, just add a couple of drops of general purpose oil inside the syringe and the piston will slide much easier.
- For solder pastes and thick fluids use the conical tips, pick the largest tip size that will work for your application: first start with the green one and check the size of the deposits, switch to a smaller one if necessary.
- Be aware that when using smaller tips, you'll probably have to reduce dispensing speed.
- If you intend to connect the dispenser with another machine like a 3D printer or CNC, double check your wiring and connections. Read and understand the external trigger diagram included here.
- You can change the torque and current draw of the device but do it at your own risk, to know more go to the full user guide online.
- The syringes, pistons and tips can be reused many times without seeing degradation in performance, before refilling clean the inside thoroughly with isopropyl alcohol wipes. Do not use sharp objects that can scratch the walls.

User Interface



To navigate between the menus use the left "Menu" knob and to change a specific value use the right "Value" knob.

These are also buttons, pressing the left knob will push the piston forward or lift the syringe (if it's not locked). The opposite happens by pressing the knob on the right.

Main



Top left: Count, useful for keeping track of dispensed pads. During this screen turning the "Value" knob will increase or decrease current count by +-1.

Top right: Dispense mode.

Bottom left: Speed.

Bottom right: Retraction setting.

1 Dispensing speed



Range from 1 to 30. For high viscosity fluids typical values are between 2 and 5, medium and low viscosity use 5 to 20. Above 20 is recommended for quick movements of the piston.

2 Retraction

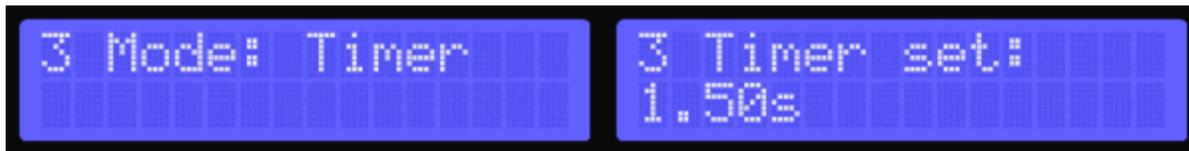


This is the distance the piston will retract automatically after dispensing, essential to prevent oozing and dripping. Typical values are between 0.10 and 0.20mm

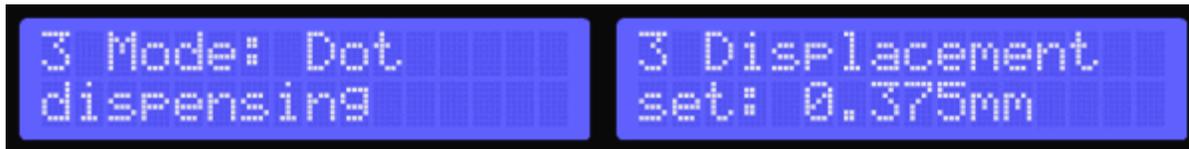
3 Modes



Manual: Press and hold to dispense.



Timer: Press start once and it will dispense for the set amount of time (timer resolution can be changed in 0.01 sec increments, read the online [advanced settings](#) page for more info).



Dot: Intended for low viscosity fluids to give more control on dispensed volume regardless of speed. Press start once and it will move the piston the set distance.

4 Counter



Enables or disables the counter on the main screen, switching on and off also resets the count.

5 Use settings profile



Displays the current active profile. A “profile” is a set of parameters that is saved in the internal memory, since each fluid and tip combination (even pad size) will have different speed and retraction values this is an easy way to change between them. When you change profile its values are immediately loaded.

Any changes you make are automatically saved to the current active profile after one dispense cycle. For example changing speed from 4 to 5 will only be saved after you actually dispense with the new value.

Show extended menu



Hides advanced settings to keep menu navigation simple. Go online to the [advanced settings](#) page for more info.

Filling the syringe



If your paste comes in a syringe pour it in the center as uniform as possible, try not to smear the sides.



Push the piston inside while squeezing the sides of the barrel with the other hand. Trapped air will escape through the small gap between the syringe walls and the piston, you can feel when this is happening.



Continue all the way down until the fluid is touching all around the bottom of the piston, this means there's no air trapped inside.

With the power switch OFF connect the motor, foot switch (if you have one) and USB cable. Then turn the dispenser ON.

Attaching the motor



First remove the cap and put the tip you'll be using based on the tip/pad size table.



Then thread the barrel in the shaft of the motor as far down as you can.



Line up the fins of the syringe and press down the right knob to lower it into position.

Stop as soon as the top of the syringe is touching the base of the adapter and twist it clockwise until it clicks into position.



(Syringe touching the top of the motor adapter)



(Syringe locked in position, touching the screws of the motor)

Now you're ready to dispense, try out the default settings: in Manual mode press and hold the pedal or start button until the desired amount has been dispensed, when you release it the piston will move back slightly to prevent oozing, this is the "Retraction" value.

Remember the piston pulls back only to release pressure, the paste itself is not meant to go back in for a noticeable amount (if any).

Here's a useful trick: if the paste keeps coming out even after the motor has stopped, quickly tap the start button again. This will advance the piston just a little bit but more importantly it will also pull back the full retraction distance which will release the internal pressure very quickly.

With the default speed, dispense several pads adjusting the retraction value until you see no oozing.

**Decrease
retraction**



OK



Perfect



OK



**Increase
retraction**



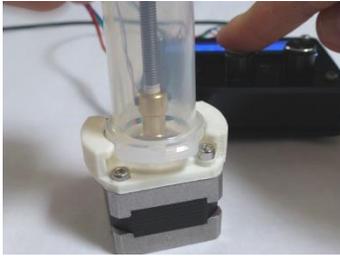
If you see that the paste comes out despite having a large retraction value ($> 0.25\text{mm}$) or that it oozes too much long after dispensing, it's very likely that air bubbles have become trapped during the filling procedure, sometimes it's not a big problem but if you see that a lot is being wasted then it's best to transfer the paste to the second syringe, try to pour it as uniform as possible this time.

Once you start getting good results you can increase the speed, do it in increments of +1 until you get the right balance between speed and consistency, with more practice you'll be able to go quicker. Keep in mind that retraction may need to be increased as well to release the extra pressure from the faster moving piston.

That's it! now your dispenser is configured for this specific tip size, and paste combination. If you change any of the two you'll need slightly different settings, I recommend you pick a different profile for each one (menu item 5), that way you can recall them quickly in the future.

Detaching motor and storing paste

When you're done with your board(s) you can store the remaining paste for later use, the process is the same as attaching the motor but in reverse:



Unlock the syringe by twisting it counterclockwise. Line it up and press the left knob to lift it up.



Once it clears the motor adapter you can turn it by hand.



For storing, remove the tip and put both caps top and bottom.

If you don't want to waste the paste left on the tip, you can also leave it on and cover it to prevent air from reaching the paste. You can use food wrap, scotch tape, a drop of hot glue, silicon, play-doh, a strand of wire, etc basically anything that covers the hole.



The tips themselves can also be cleaned: remove the paste with a toothpick and then with a rolled up napkin wipe the inside, a couple of drops of isopropyl alcohol help a lot.

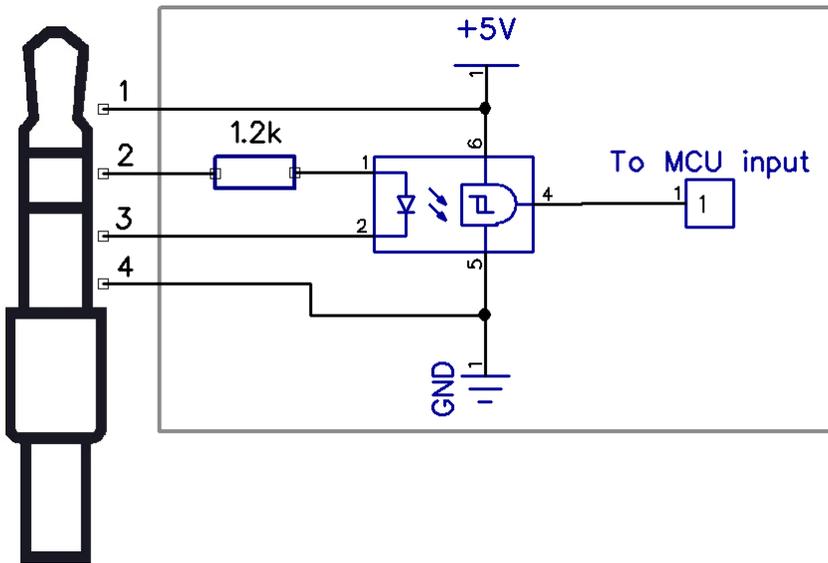
Connecting to an external source

The dispenser has an optically isolated input for triggering the dispenser remotely. It also provides power from the USB port, this makes it very flexible since it allows you connect simple switches, other systems with a wide voltage range (3-12V) and even sensors powered directly from the dispenser.

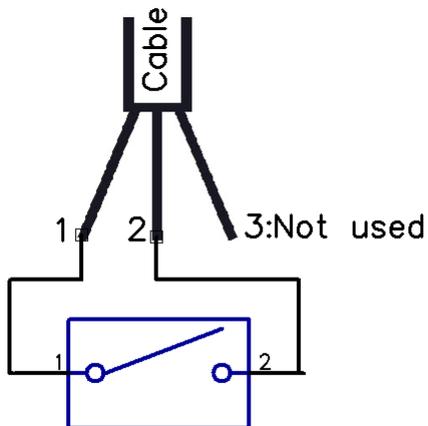
Note 1: Always check with a multimeter to see which strands in the cable correspond to which pins in the plug, a mix up can short the USB port and damage your device and/or power supply.

Note 2: Shut down the unit when plugging the cable to prevent accidental dispensing.

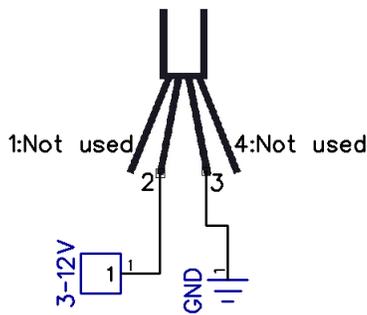
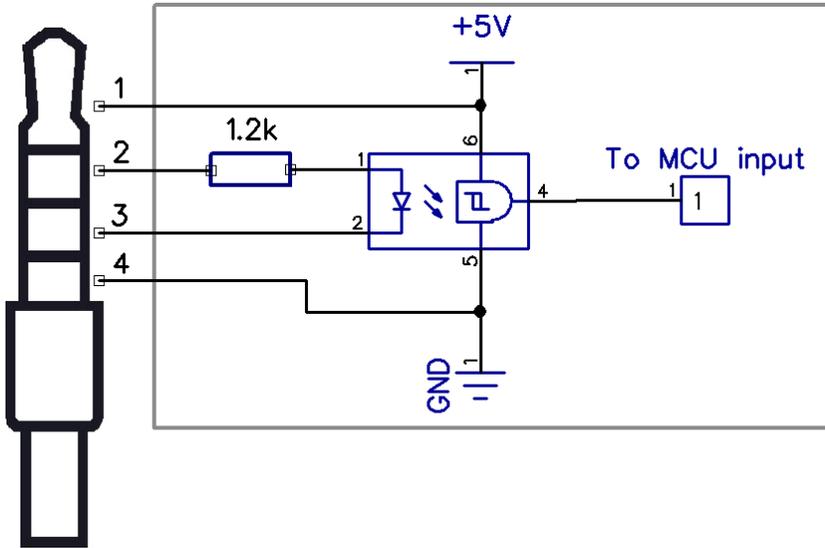
Standard 3.5mm cable with three conductors:



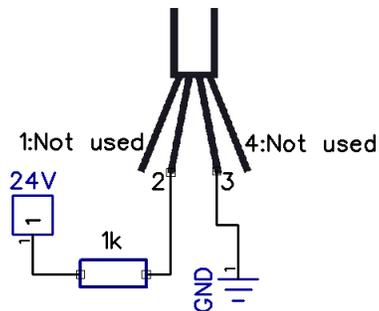
Using a simple external switch:



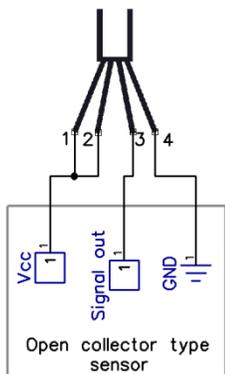
For connecting other devices (3D printers etc) you can also use a 3.5mm cable with 4 conductors to isolate grounds between the two systems:



If you don't have a 4 conductor cable you can also use a regular one, with the same connection shown left minus the 4th cable. The only difference is that the dispenser and external device grounds will be shared.



If you want to extend the trigger voltage to 24V an external 1k resistor (1/4W rated) has to be added in series like this.



Pin 1 provides a 5V output which you can use to power an external sensor, in this case a proximity IR.

Vacuum pick up mode.

This mode allows you to pick up SMD components for an easier assembly of your boards.

With an empty syringe, the piston can be quickly pulled back to create a small vacuum that lifts the components.

Before you start, remember to add a little bit of oil in the syringe you'll be using, then move the piston back and forward until you feel that the movement is smooth. Add just enough to lubricate and create a seal all around the piston, you don't want oil coming out the front when you push it all the way forward.

Go to this menu screen:



And change to "Yes"

Then go to menu screen #6:



As long as you remain in this screen you'll be in pick up mode.

Attach the motor to the empty syringe and push the left knob to move the piston to the front, put a stainless tip on the syringe.

- Press and hold Start (or foot switch) you should be able to lift the component right away. Keep pressing the button for 1 or 2 seconds to create a strong enough vacuum. Sometimes you can even hear the pitch of the motor change when the vacuum has been created properly.
- Now you can release the button, the piston will stop moving and the part will be held in the tip.
- Place your component in the pad and press the Start button again just once. The piston will return and release the part, it will stop automatically at the end of the syringe. Repeat for all the components in your board.

For a more comfortable grip you can bend the steel needles with a pair of pliers or with the rounded edge of a table, just pay attention to the orientation and be careful not to break them. The rubber suction cup accessory is used for picking up ICs.

For more advanced features make sure to visit the full user guide online at: <https://dmdispenser.wordpress.com/>