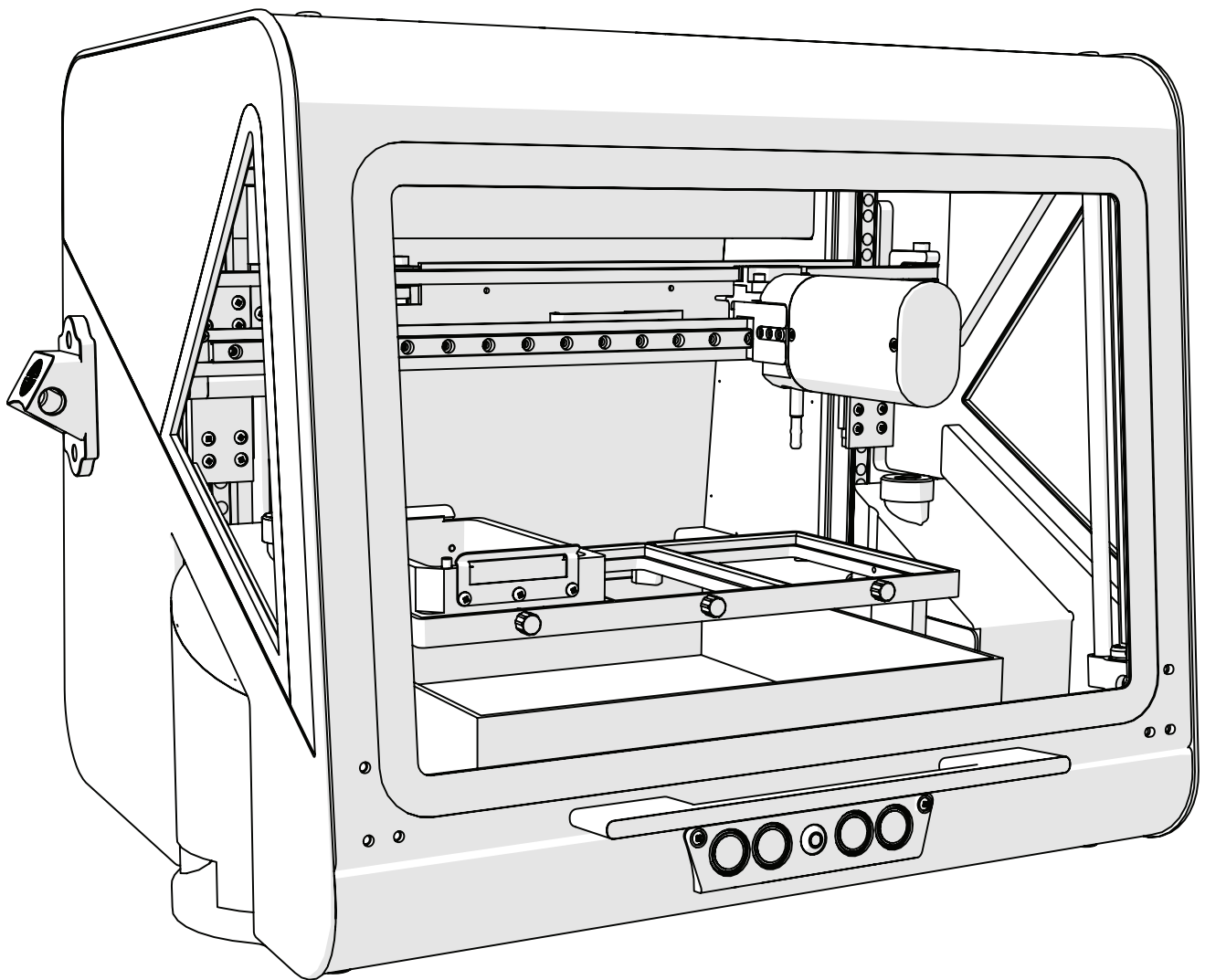




**SINGER  
INSTRUMENTS**  
A RESPONSIBILITY TO SCIENCE!

# SQWERTY!

QUICK START GUIDE v1.1



For more support  
resources visit  
[bit.ly/SQWERTYhelp](https://bit.ly/SQWERTYhelp)





## READ BEFORE YOU START!

- **Minimum System Requirements**
  - OS Windows 10 Home/Professional
  - Memory 4GB Ram
  - Storage 60GB SSD
  - Processor Intel® Core™ m3 or above
  - Display resolution at least 1920x1080
- **Supported labware!** SQWERTY accepts SBS standard labware. Smaller labware can be accommodated using a rack or adapter.
- **Labware types** Visit [bit.ly/ SQWERTYPipetteModule](https://bit.ly/SQWERTYPipetteModule) for a full breakdown of all supported labware types.
- **Use the correct tip style.** SQWERTY supports the Tecan LiHa style of robotic tip. We can't guarantee that other tip styles will fit or work as expected.

# JOIN OUR DISCOVERY COMMUNITY!

**Join our Discovery community and help us make the product features YOU want.**

The Discovery Community is a group of scientists helping us to understand and solve anything causing frustration in their lab.

Help us to shape product development and have a say in future product updates. You'll also get early access to new features and be able to test things before release.

We'll even throw in some cheeky vouchers, Singer discounts and maybe even some cake!

Scan the QR Code or visit [bit.ly/DiscoCommunity](https://bit.ly/DiscoCommunity) to join.



**[bit.ly/DiscoCommunity](https://bit.ly/DiscoCommunity)**

2	Read before you start!
4	Introduction
5	OUT OF THE BOX
6	Anatomy & Features
10	Unboxing & Assembly
13	Tips & Labware
14	Connecting TO SQWERTY
15	Method 1: Ethernet Cables
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## **SQWERTY**

### **INTRODUCTION**

SQWERTY is a new generation of pipetting. A compact pipetting robot built for everyday use. SQWERTY makes it quick and easy to run complex pipetting workflows involving almost any liquid or labware.

The information in this guide relates to software version:  
1.10.0

### **FULL USER GUIDE AVAILABLE HERE:**



**[bit.ly/SQWERTYguide](https://bit.ly/SQWERTYguide)**

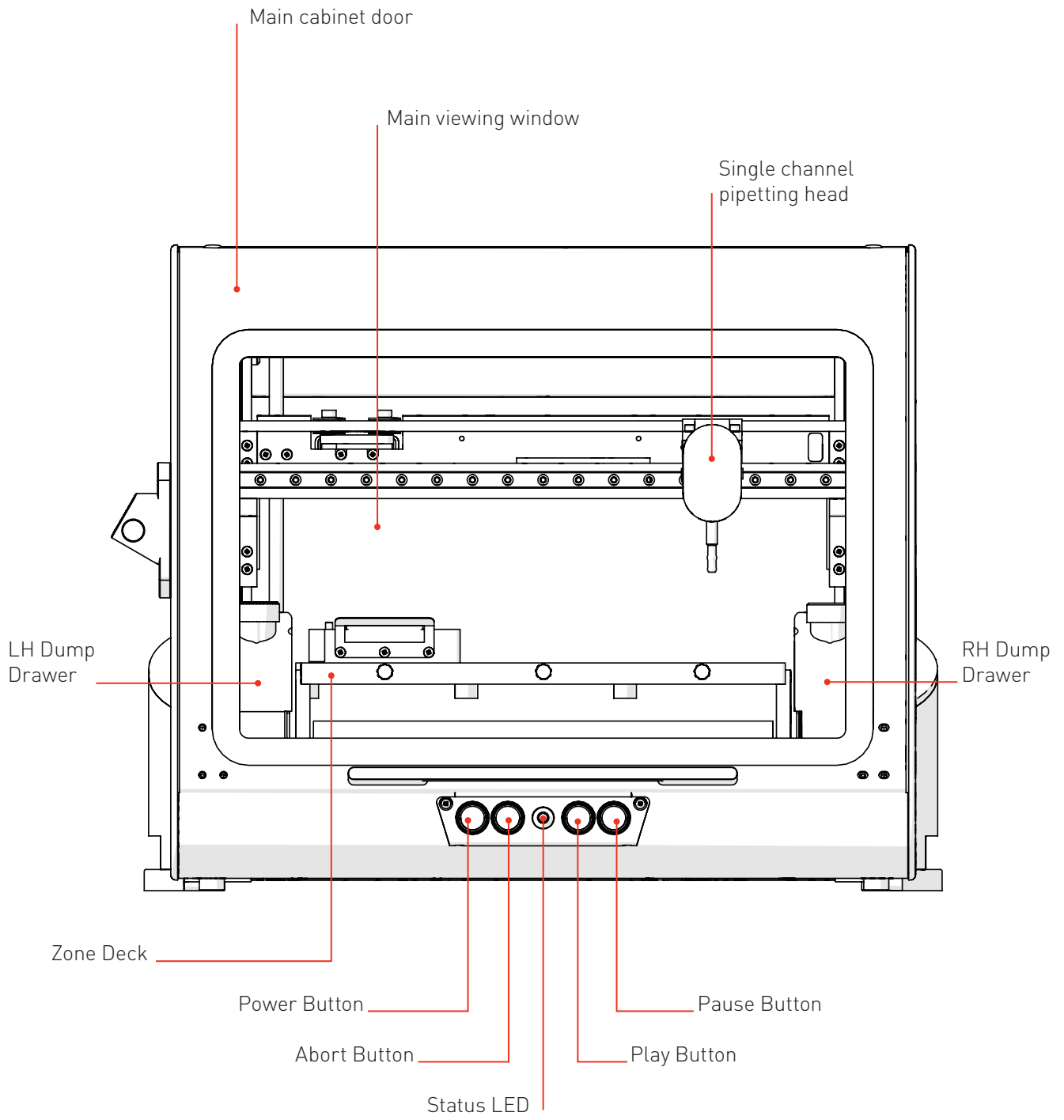
# OUT OF THE BOX

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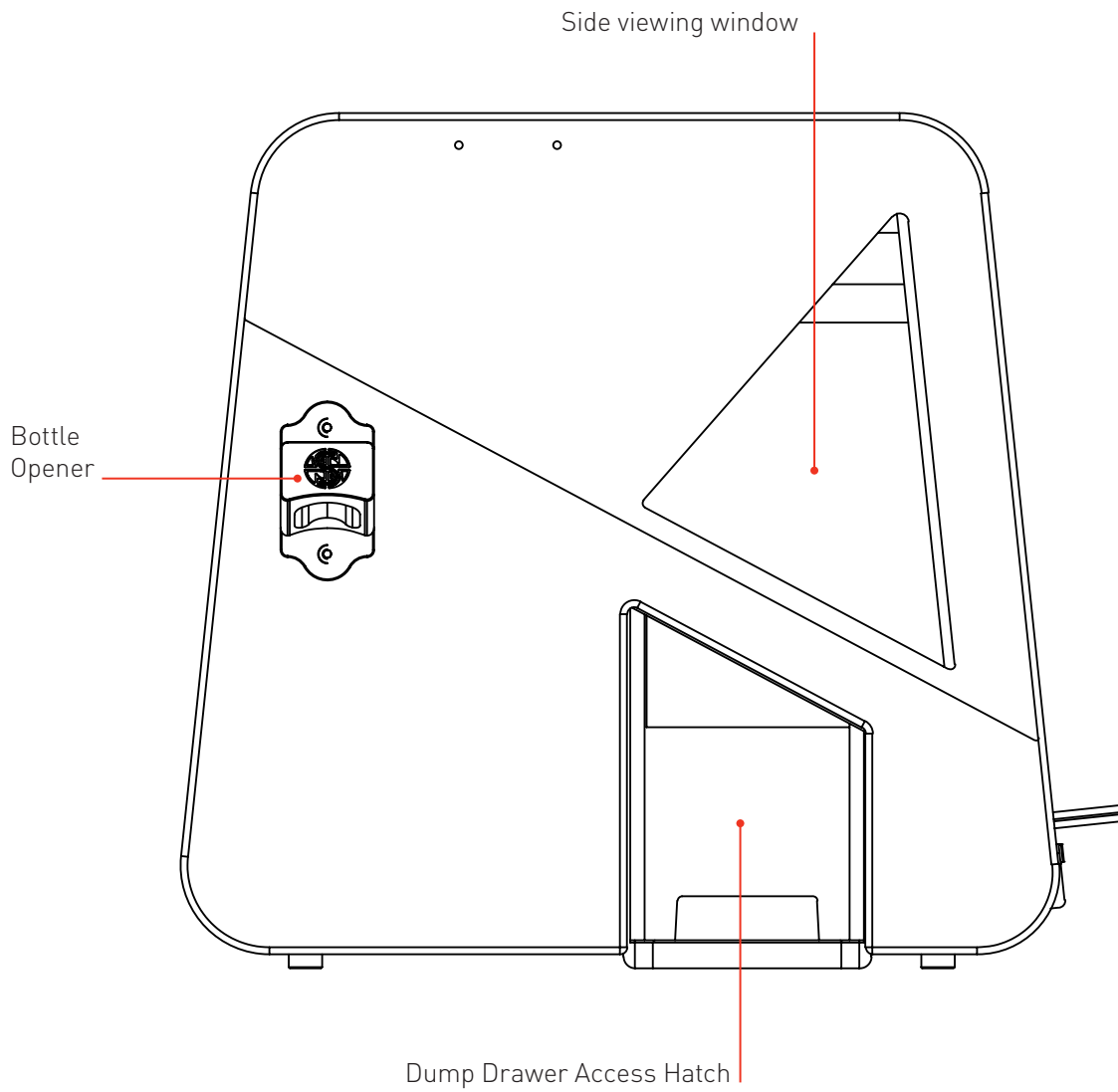
Find out what comes with SQWERTY. We'll take you through the steps involved in unboxing and assembling ready for your new life of pain-free pipetting.

# ANATOMY & FEATURES

## FRONT



**ANATOMY & FEATURES**



## ANATOMY & FEATURES

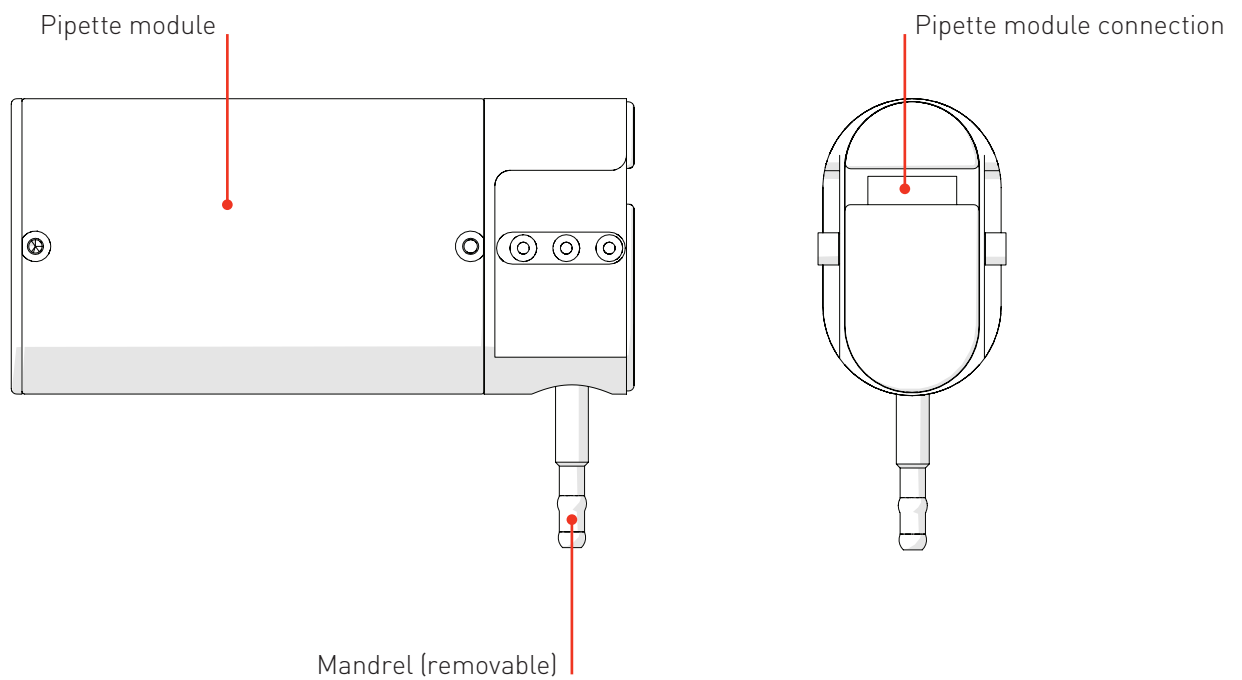
### PIPETTE MODULE

SQWERTY is supplied with a 250µl Calibrated Pipette Module as standard.



\*The latest datasheet on pipette module precision and accuracy can be found by scanning the QR code.

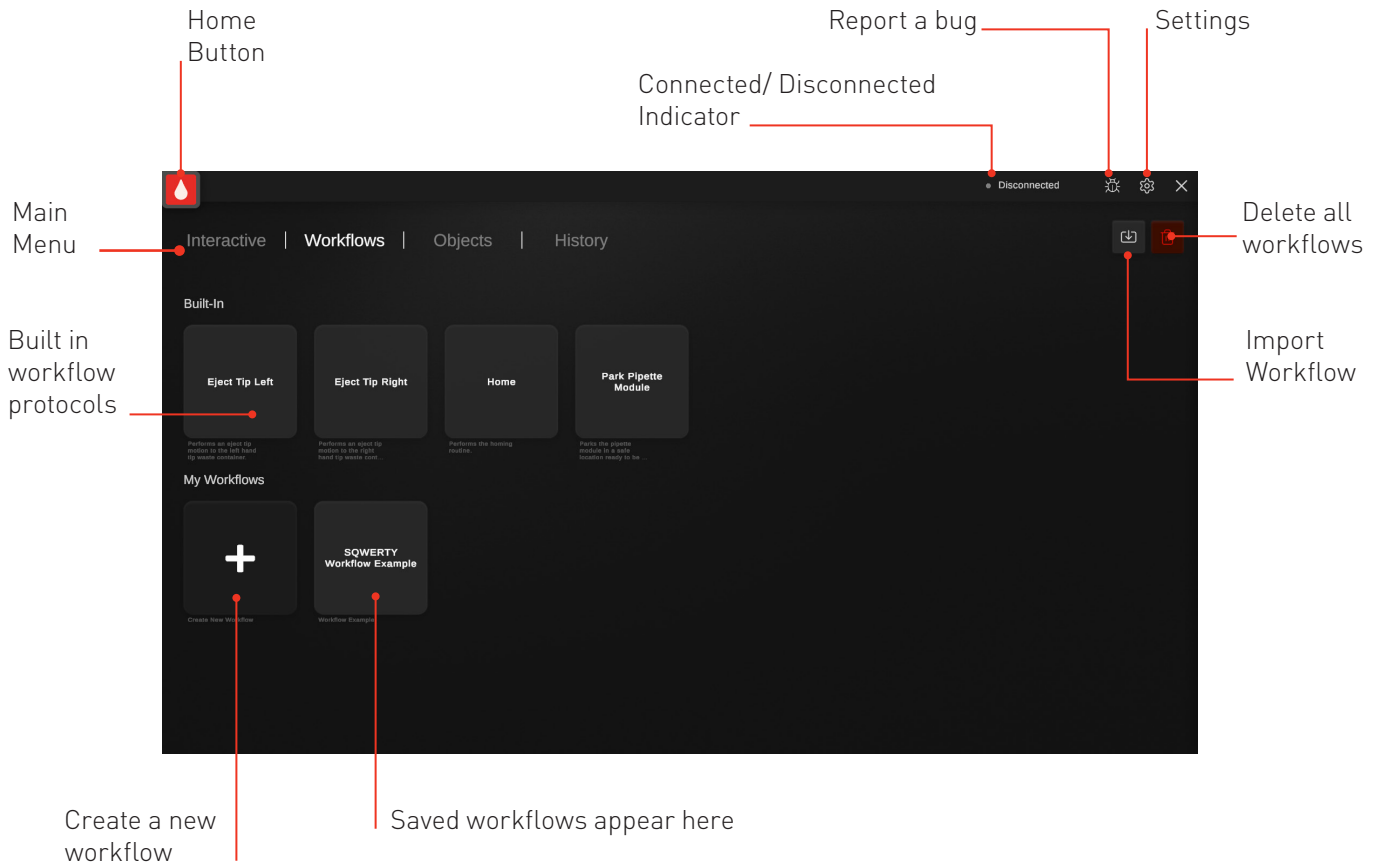
**[bit.ly/SQWERTYPipetteModule](https://bit.ly/SQWERTYPipetteModule)**



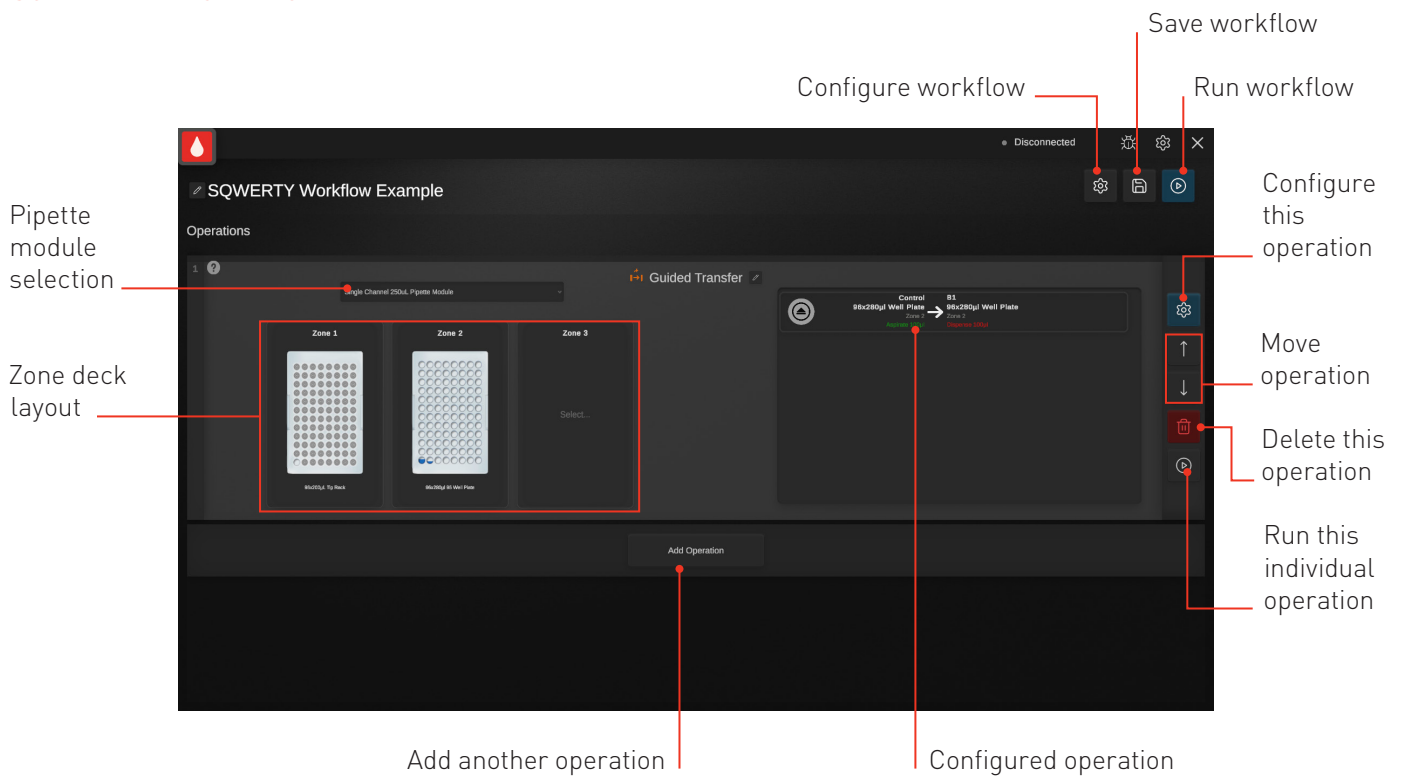


# ANATOMY & FEATURES

## SOFTWARE - MAIN MENU



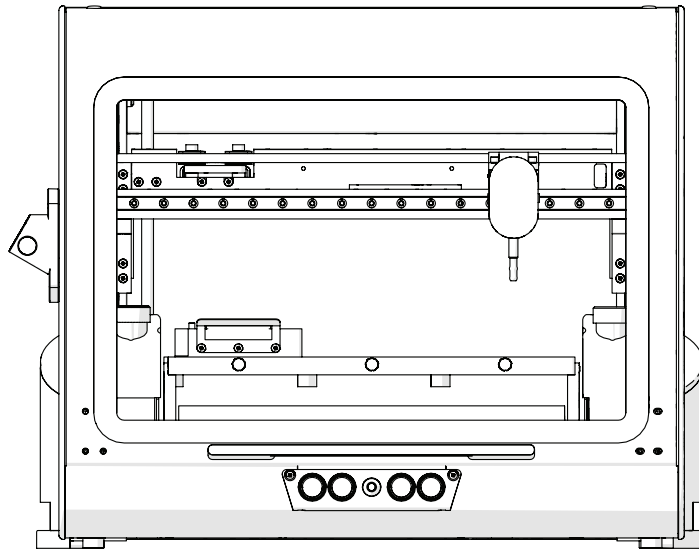
## SOFTWARE - WORKFLOW



SQWERTY BOX

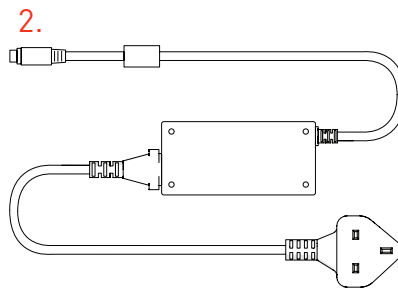
- 1. SQWERTY Liquid Handler

1.

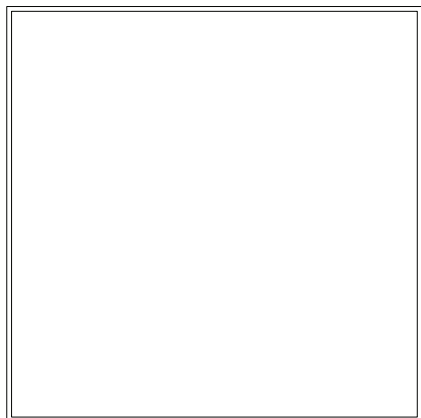


ACCESSORIES TRAY

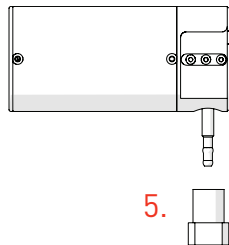
- 2. Power Supply
- 3. Drip Tray
- 4. 250µl Calibrated Pipette Module
- 5. Pipette Module Mandrel Removal Tool
- 6. Calibration Tools
- 7. Waste Containers (Left & Right)
- 8. Tip Rack Adapter
- 9. Tip Rack Stand



3.



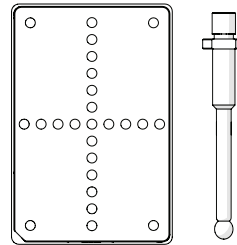
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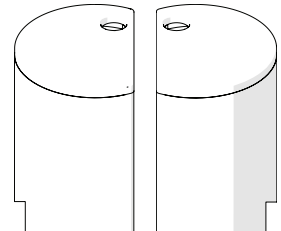
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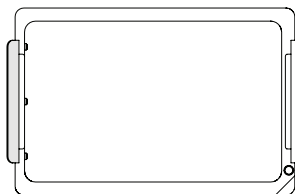
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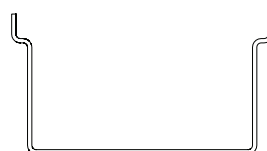
7.



8.

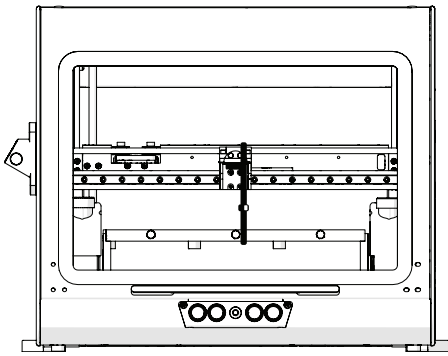


9.



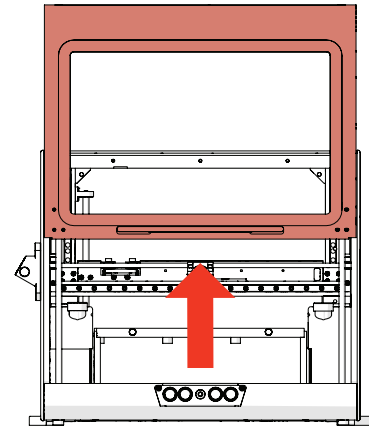
## UNBOXING & ASSEMBLY - SQWERTY

1



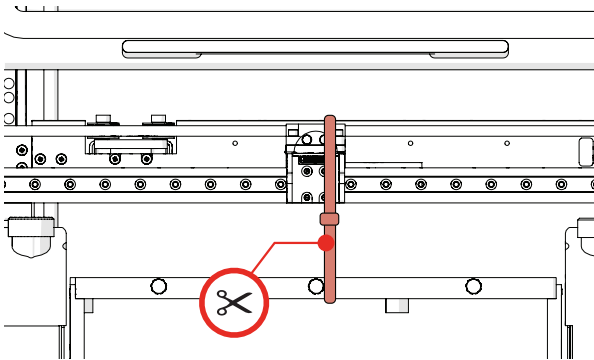
- Remove SQWERTY from its packaging and position on your workspace.

2



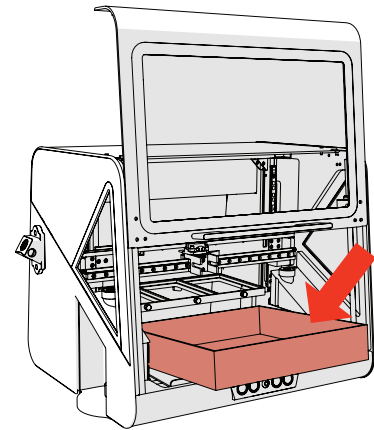
- Lift up the SQWERTY cabinet door.

3



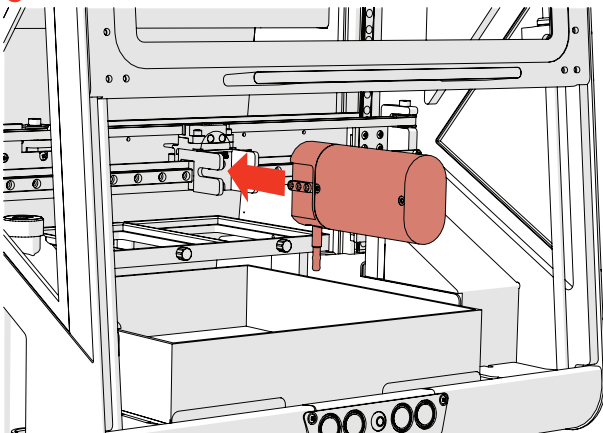
- Carefully cut and discard the cable tie securing the zone deck.

4



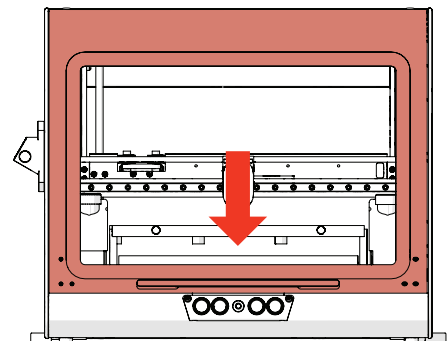
- Insert the Drip Tray underneath the deck.

5



- Attach the pipette module into its locator. Ensure that the pipette module is pushed all the way in.
- NOTE: SQWERTY will not run if the pipette module is not connected properly.

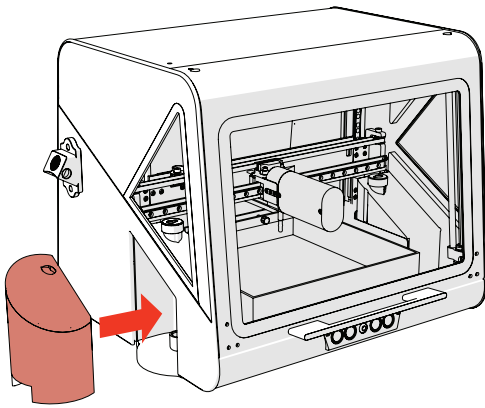
6



- Close the SQWERTY door

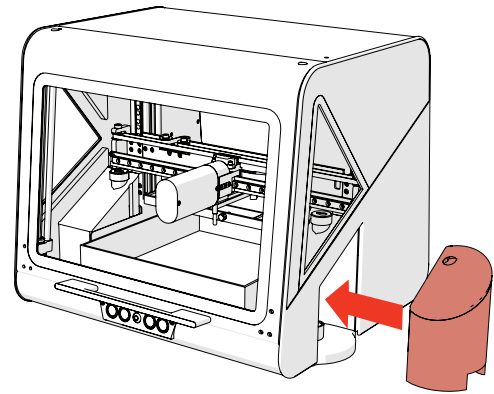
## UNBOXING & ASSEMBLY - SQWERTY

7



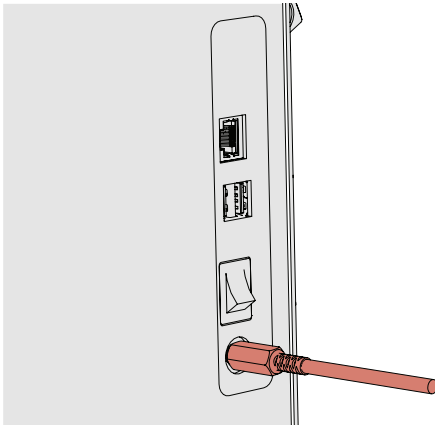
- Insert the left-hand waste container into the left bay.

8



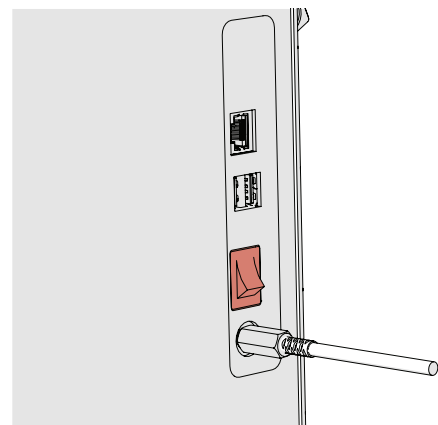
- Insert the right-hand waste container into the right bay.

9



- Plug in the power supply into the wall and the power socket on the back of SQWERTY.

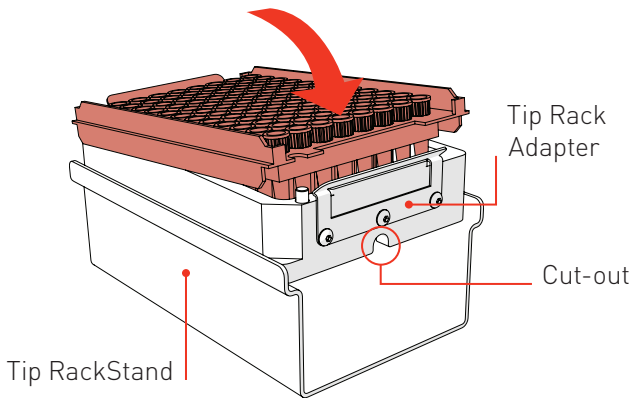
10



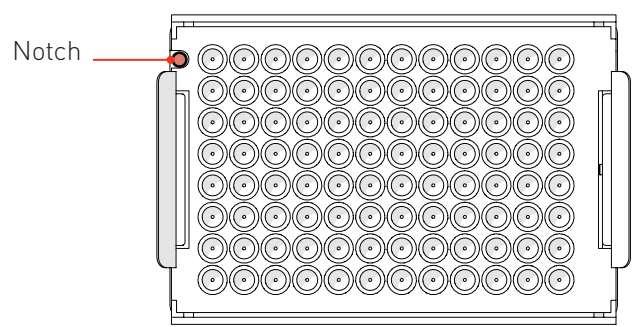
- Turn on SQWERTY using the power switch on the back. SQWERTY will perform its initialisation routine which should take about 50 seconds.
- Download the software from the email sent to you.

## UNBOXING & ASSEMBLY - TIPS AND LABWARE

1

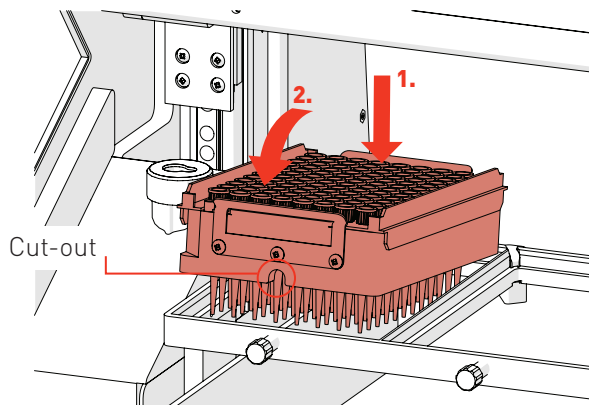


- Place the tip wafer onto the Tip Rack Adapter.
- Line up the notch in the wafer with the upstand on the tip rack adapter to ensure the correct orientation.

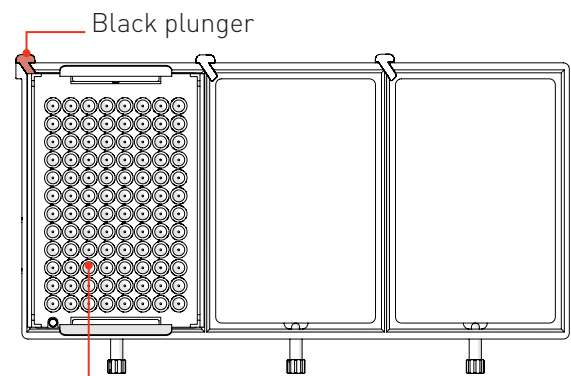


- Make sure the wafer is firmly under the clips on the Tip Rack Adapter
- Use the Tip Rack Stand to support the Tip Rack Adapter when inserting the tips wafer.

2



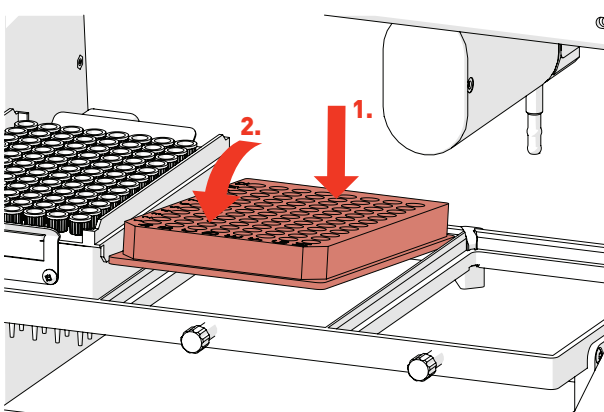
- Pipette tips are always inserted into Zone 1. Insert the back of the Tip Rack Adapter (1) and Wafer into Zone 1 on the deck.
- The cut-out should face towards you.



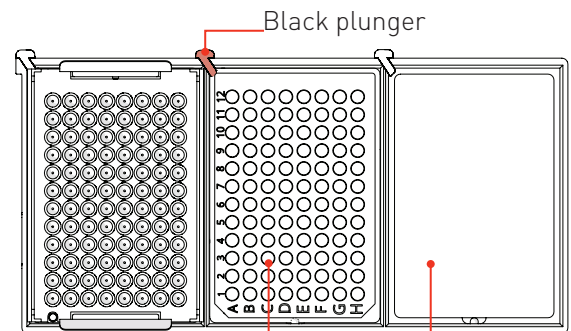
Zone 1

- (2) Firmly push against the black plunger and lower the front of the adapter onto the deck.

3



- All other labware is inserted into Zone 2 and 3. Insert the back of the plate (1) used into Zone 2 or 3 on the deck.



Zone 2

Zone 3

- (2) Firmly push against the black plunger and lower the front of the plate onto the deck.

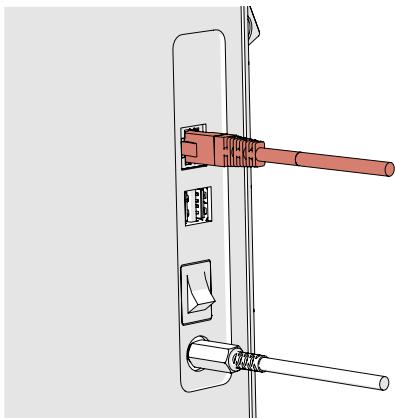
# CONNECTING TO SQWERTY

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You can connect to SQWERTY either via Ethernet or over WiFi. The following section will breakdown each method.

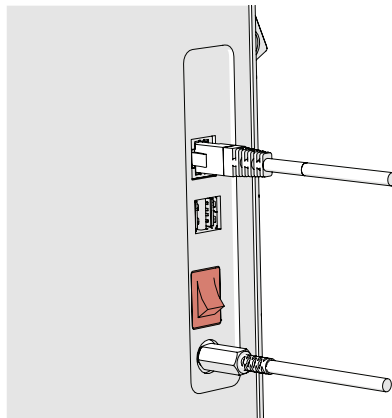
## CONNECTING TO SQWERTY - METHOD 1: ETHERNET CABLES

1



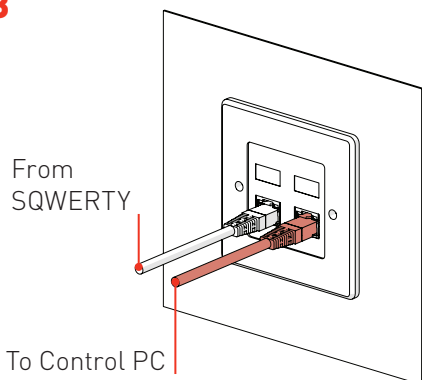
- Connect an ethernet cable between SQWERTY and an ethernet socket.

2



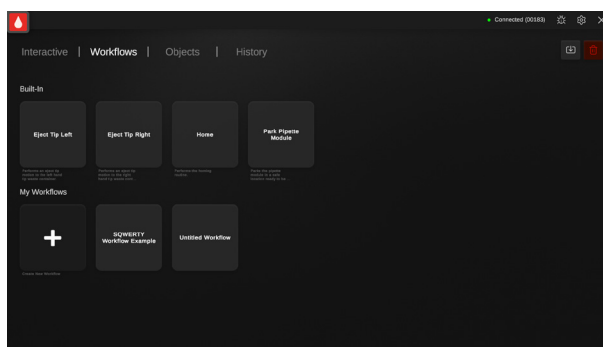
- Power on the SQWERTY unit.

3



- Connect a second ethernet cable between a second ethernet socket on the same network and a computer running the SQWERTY software.

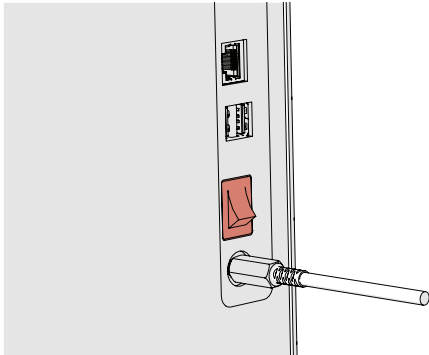
4



- Open up the SQWERTY software. The SQWERTY unit will be automatically connected and ready to do some science.

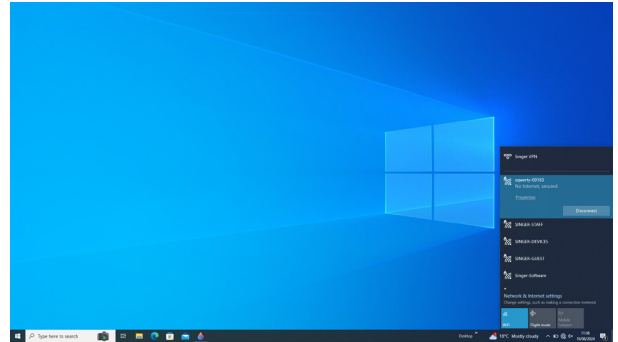
## CONNECTING TO SQWERTY - METHOD 2: WIFI

1



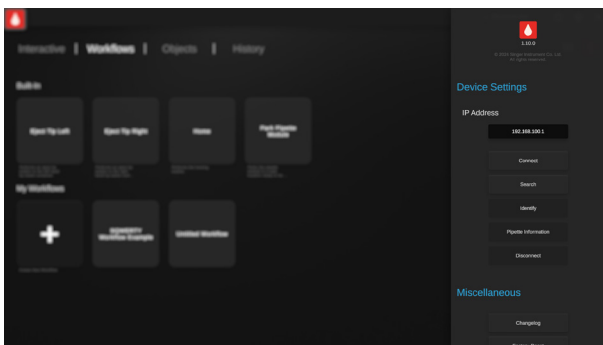
- Power on the SQWERTY unit.

2



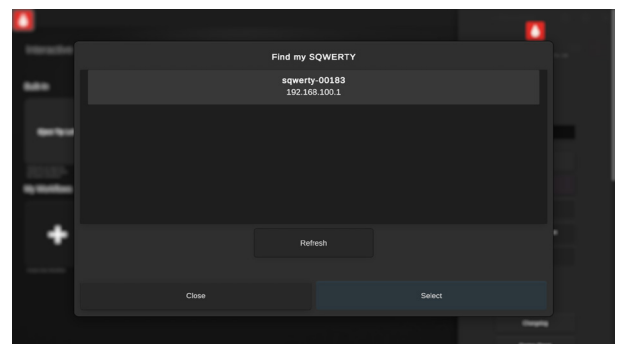
- Open the list of available, WiFi Connections on the control PC and select the sqwerty-xxxxx option.
- The password can be found by the serial number window on the back of the machine.

3



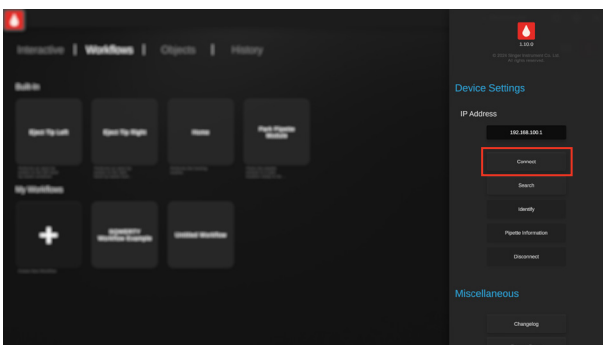
- Open the SQWERTY software and press the cog in the top right hand corner to load the device settings.

4



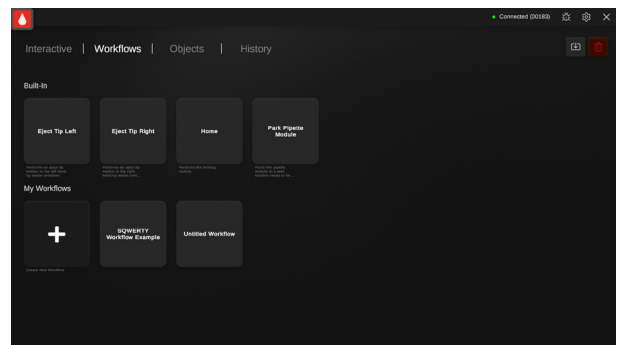
- Press Search to open up the *Find my SQWERTY* menu and select your SQWERTY unit from the list.
- Press the blue select button to continue.

5



- Press the Connect button in the device settings menu and wait 15 seconds for SQWERTY to connect.
- To confirm the connection, press the Identify button and SQWERTY will flash its internal lights.

6



- SQWERTY is now connected and ready to do some science.
- NOTE: The software will remember the SQWERTY unit IP address, the next time you open the software you can skip step 4.



## TROUBLESHOOTING

### PROBLEM

Not all liquid is being dispensed from the tip.

Blowout is missing some liquid, it's sticking to the inside of the pipette tip.

Air is being aspirated into the tip instead of liquid.

Liquid Level Detection (LLD) is too sensitive (Missing the liquid level).

Liquid Level Detection (LLD) is detecting external drips instead of the surface of the liquid.

Liquid Level Detection (LLD) is super slow.

My tip is travelling deeper into the source location than specified.

There's too much volume in my tip but I'm only transferring 200µL (within pipette module range)

My labware is overflowing with liquid.

I lost a tip underneath the tray in SQWERTY.

### SOLUTION

Try enabling Blowout and steadily increase the blowout volume. Click on Aspirate *Advanced Parameters* to change the volume.

Access *Liquid Class* settings by clicking on the cog icon in the bottom right corner of the software and reduce the *Blowout Flow Rate*.

Modify the immersion depth to ensure the tip is reaching the liquid. Use the +/- buttons or type in a depth in the Aspirate section. If your using a higher viscosity liquid, slow down the *Aspiration Flow Rate* in the *Liquid Class* settings.

If using a liquid class other than water, increase the *LLD Pressure Threshold* parameter in the *Liquid Class* settings. If the problem persists, increase *LLD Extra Travel* in aspirate *Advanced Parameters*.

Use a shallower depth for dispensing. If you have mixing enabled, don't forget to modify that depth in dispense *Advanced Parameters*. Finally, try decreasing *LLD Extra Travel* in aspirate *Advanced Parameters*. If the problems still persist, turn on tip eject in the dispense Parameters to prevent external drips from even occurring.

In the *Liquid Class* increase *LLD speed*. If unsatisfied with the speed, consider switching to using manual aspirate/dispense immersion depth settings with *Liquid Level Tracking* enabled instead of LLD.

Decrease *LLD Extra Travel* in aspirate *Advanced Parameters* and the *LLD Pressure Threshold* in *Liquid Class* settings. If this doesn't work, reduce the *LLD Speed* in the *Liquid Class* settings.

Check the values for *Blowout* and *Travel Air Gap* in the aspirate *Advanced Parameters* as they both count towards the volume range. Readjust the *Travel Air Gap : Your Liquid : Blowout* ratio to sum up to the pipette module maximum volume.

Remember that liquid displacement exists because SQWERTY doesn't! Adjust the immersion depth of the pipette tip to be right at the top of the liquid surface, or lower the amount of liquid in the source well/tube.

Turn off the main unit and remove the drip tray. Tip SQWERTY backwards to see if the tip rolls out towards the back of the unit. Feel around with your hands and remove it if you can. If it's still stuck or unreachable, use a screwdriver to undo the two small screws in the centre front and two in the centre back (these hold the metal base sitting underneath the drip tray). Keep the screws and washers in a safe space while you remove the metal tray and retrieve the tip. Replace the metal tray and hold it in place with the washers and screws. Place two opposite screws (no washers) front and back to hold the plate down. Screw in the remaining screws (with washers) tightly. Replace the original pair of screws but this time with the washers in place.

## TECHNICAL SPECIFICATIONS (HARDWARE)

### GENERAL

- Vertical Sliding Door
- X Deck with (3x) SBS/ANSI Zones
- Tip Eject Containers (Left Hand and Right Hand)

### DIMENSIONS

- Length: 421mm (16.6")
  - Width: 405mm (16")
  - Height (Door Closed\*): 365mm (14.4")
  - Height (Door Open\*): 598mm (23.5")
- \*From Bench Top

### WEIGHT

- 16kg (35 lbs) without accessories or consumables

### NO COST ACCESSORIES

- Bottle Opener
- Calibrated Pipette Module (variable volume  $\leq 250\mu\text{l}$ )\*
- Deck Calibration Verification Plate
- Tip Waste Calibration Tool
- Calibration Probe
- Gloss Black Acrylic Drip Tray
- Tip Waste Container (Left & Right)
- Tip Waste Container Lid (Left & Right)
- Pipette Module Mandrel Long - Type A
- Pipette Module Mandrel Removal Tool - Type A
- Tip Rack Adapter (25mm Height) - Mandrel Type A
- Plate Holder - Stainless Steel



\*The latest datasheet on pipette module precision and accuracy can be found by scanning the QR code.

[bit.ly/SQWERTYPipetteModule](https://bit.ly/SQWERTYPipetteModule)

### POWER REQUIREMENTS

- 110-240V AC 50-60Hz 3 Amps
- External power supply: 24V DC, 6.75A

### MINIMUM SYSTEM REQUIREMENTS

- OS Windows 10 Home/Professional
- Memory 4GB Ram
- Storage 60GB SSD
- Processor Intel® Core™ m3 or above
- Display resolution at least 1920x1080

### LED ILLUMINATION

- Internal Illumination LED (White Light)
- UV-C Sterilisation LED (265nm)

### CONNECTIVITY

- (2x) USB 3.0
- Ethernet
- WiFi

### OPERATING CONDITIONS

- For indoor use only - fluctuations not exceeding 10% of nominal walls or other items
- Use in a well-ventilated area
- Ambient temperature range 15°C to 40°C (59°F to 104°F)
- Altitude to 2000m (6500ft)
- Relative humidity not exceeding 80%
- Mains supply
- Overvoltage category II IEC60364-4-443
- Pollution degree 2 IEC664
- Use with a minimum distance all round of 200mm (8") from walls or other items

### SUGGESTED TIP EJECT CAPACITY

- Tip Eject Capacity 10 $\mu\text{l}$  - 96 Tips (20 $\mu\text{l}$  type with filter)
- Tip Eject Capacity 20 $\mu\text{l}$  - 96 Tips
- Tip Eject Capacity 50 $\mu\text{l}$  - 48 Tips
- Tip Eject Capacity 175 $\mu\text{l}$  - 48 Tips (200 $\mu\text{l}$  type with filter)
- Tip Eject Capacity 200 $\mu\text{l}$  - 48 Tips
- Tip Eject Capacity 1000 $\mu\text{l}$  - 12 Tips

### MOVEMENT SPEED

- Max speed:
  - X: 200mm/s
  - Y: 200mm/s
  - Z: 60mm/s
- Max acceleration:
  - X: 300mm/s<sup>2</sup>
  - Y: 300mm/s<sup>2</sup>
  - Z: 300mm/s<sup>2</sup>

### DISPENSE SPEED

- Calibrated Pipette Module  $\leq 50\mu\text{l}$  - 1800  $\mu\text{l/s}$
- Calibrated Pipette Module  $\leq 250\mu\text{l}$  - 450  $\mu\text{l/s}$
- Calibrated Pipette Module  $\leq 1000\mu\text{l}$  - 150  $\mu\text{l/s}$

### COMPATIBLE LABWARE

- SBS/ANSI format plates
- Max density 384-well plate
- Tecan LiHa style pipette tips
- Microcentrifuge tubes (1.5-2ml Eppendorf style)
- 0.2ml, 0.5ml PCR tubes

### OPERATING NOISE

- < 60dbA

### OPERATING HUMIDITY

- 20-80% RH at 40°C (104°F)

### RECOMMENDED MEDIA TEMPERATURE

- 15-40°C (59-104°F)

## TECHNICAL SPECIFICATIONS (STANDARDS)

### COMPLIANCE STANDARDS

- ISO 23783

### LIQUID HANDLING STANDARDS

- IEC61010-1: 2010 + A1:2016 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1 : General requirements.
- EN 61326-1: 2021 - Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements.
- ETSI EN 301 489-1 v2.2.3 (2019) - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility.
- FCC CFR 47: Part 15: B: 2015 - Radio Frequency Devices.
- CES-003 Issue 7 - Innovation, Science and Economic Development Canada. Spectrum Management and Telecommunications. Interference-Causing Equipment Standard Information Technology Equipment (including Digital Apparatus).
- EN 62471:2008 - Photobiological safety of lamps and lamp systems.

### MEDICAL DEVICES AND CLINICAL DIAGNOSTIC COMPLIANCE & USAGE

- Not compliant

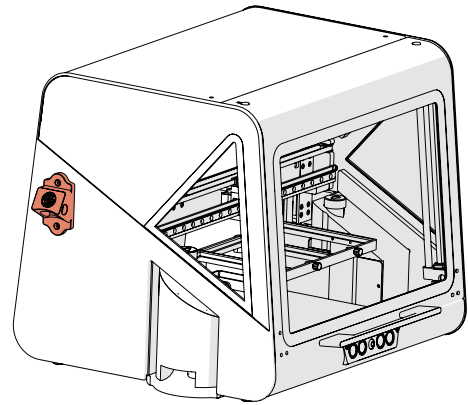
## POST-EXPERIMENTAL PROCEDURE

1



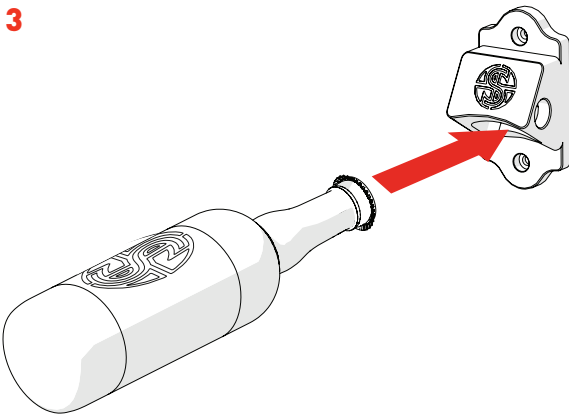
- Select a Delicious Beverage.

2



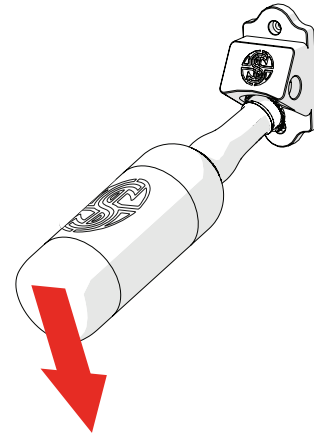
- Locate the Bottle Opener on your SQWERTY.

3



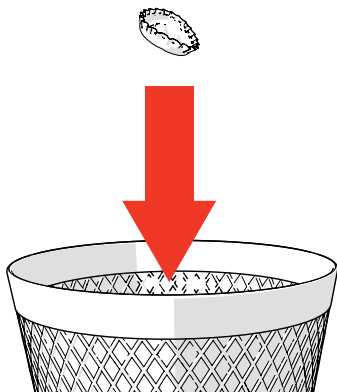
- Insert the Bottle into the Bottle Opener.

4



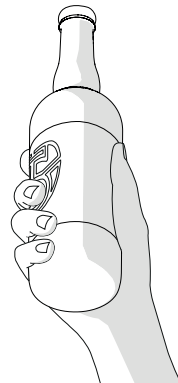
- Lever the Bottle to remove the Bottle Cap.

5



- Place the Bottle Cap in the Bin. Nobody likes a litter bug!

6



- Success! Time to enjoy your Delicious Beverage - you've earned it!
- Repeat steps 1-6 until suitably relaxed.





**SINGER  
INSTRUMENTS**

A RESPONSIBILITY TO SCIENCE!

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**DISCLAIMER**

At Singer Instruments, we are constantly seeking to improve our products and adapt them to the requirements of modern research techniques and testing methods. This involves modification to the mechanical structure and optical design of our instruments. Therefore, all descriptions and illustrations in this user guide, including all specifications are subject to change without notice.