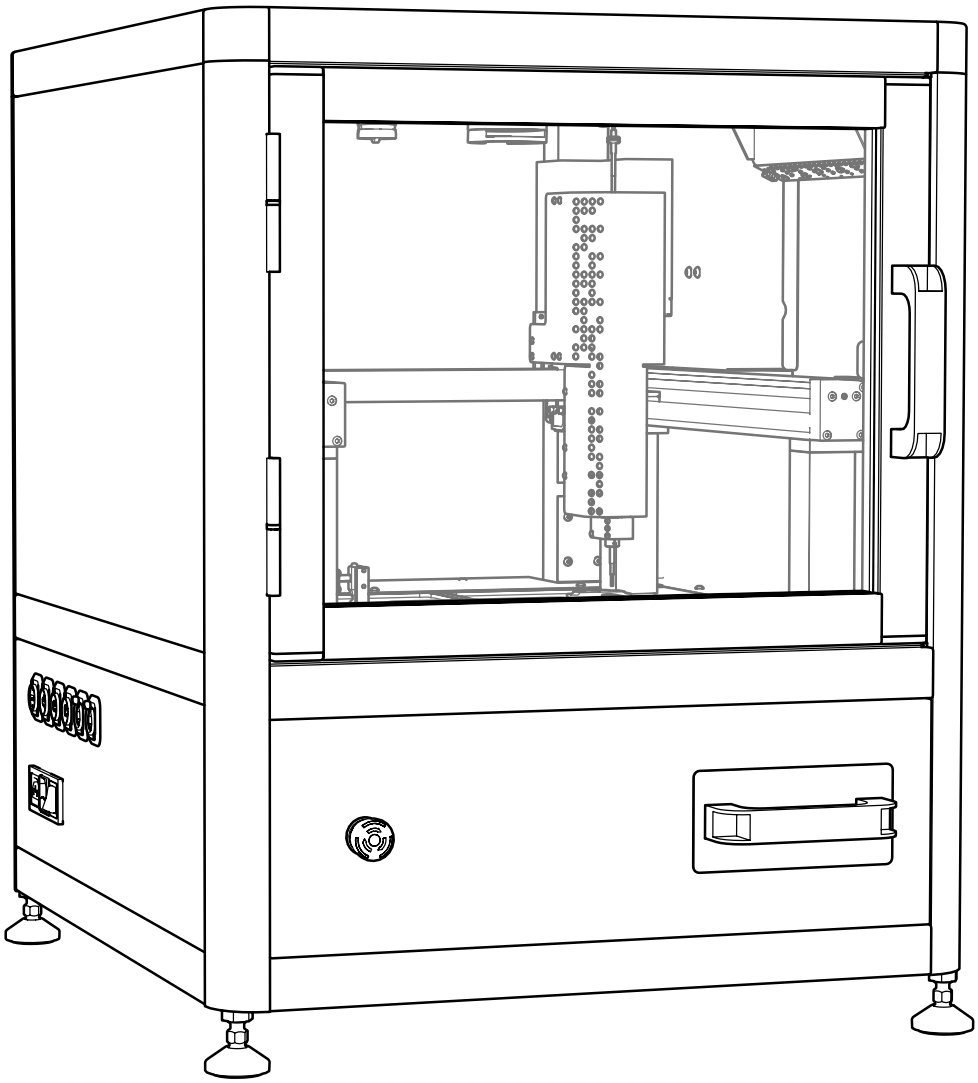
USER GUIDE v2.9



IMPORTANT COVID-19 INSTALLATION NOTICE

Due to current travel restrictions we're unable to perform on-site installation. But never fear! To get you up and running as quickly as possible we have instead included detailed instruction on how to self-install the PIXL (see page 14). We ask that you contact our Tech Support Team to let them know when you're planning to perform the self-installation so they can be on hand should you require any assistance: *technicalsupport@singerinstruments.com*

Once the installation is complete, please fill-in the online Self-Installation Form: *http://bit.ly/Selfinstallation*

You will be asked to create an account before you start. You can also use this form to report any issues encountered during installation.

NOTE: Completion of this form will activate the start of your warranty period. Failure to complete the form may affect the support we are able to offer during the warranty period.

Thanks for being awesome!

READ BEFORE YOU START!

- The blade is sharp! Be careful when handling the PIXL blade. Always follow the instructions on page 41 when changing blades.

- Hand feed the PickupLine™ carefully. When feeding a PickupLine™ into the machine, if you feel resistance, pull back slightly and re-feed. Forcing the PickupLine™ through will cause damage to the machine.

- Remove lids when placing plates into the PIXL. Lids need to be manually removed. Failure to do so will cause damage to the picking arm.

- The nozzle is hot! Be careful when removing the nozzle as it can get quite hot.

- The feed button is disabled. The feed button is disabled on all PIXL machines. The retract button is fully functional during the change PickupLine maintenance routine.

- Door interlock. For safety reasons PIXL is sold with an interlocking door guard, which acts as: a physical barrier to potentially dangerous moving components; UV protection when the product is running its sterilisation protocol; and contains a sensor ensuring that the motors and UV bulb are disabled when the door is open. Do not attempt to tamper with or override this sensor. If the door is removed then a Risk Assessment is recommended to mitigate the above factors within any third party integrations or enclosures. Singer Instruments will not be liable for any accidents or damage caused by the removal of the door, or other user negligence. Please report any faults with this sensor, or any of the safety mechanisms immediately to your technical support team.

4. Read before you start!

5. Introduction

7. OUT OF THE BOX
8. Anatomy & features

14. Unboxing & assembly

19. RANDOM COLONY PICKING
20. Random colony picking overview

27. RE-ARRAY
28. Re-array overview

31. COLONY DETECTION
32. Colony detection overview

37. MAINTENANCE MENU
38. Replace PickupLine™

41. Change blade

43. Replace nozzle

44. Calibrate nozzle/camera

45. Clean waste chute

46. Change UV bulb

47. BEST PRACTICE
48. Plates

49. Filters & blackout screen

50. Cleaning

51. Project templates

52. Pinning and mixing profiles

53. Help - See how videos

54. Software icons

57. Troubleshooting

58. Creating a Re-array file

62. Notes

PIXL™

INTRODUCTION

An ultra-reliable and super-easy-to-use microbial colony picker. It automates imaging, colony recognition, colony selection, and picking; from Petri dishes to multiwell plates.

USER GUIDE

Follow these instructions to get the most out of the PIXL. This guide outlines getting started and general operation.

DISCLAIMER

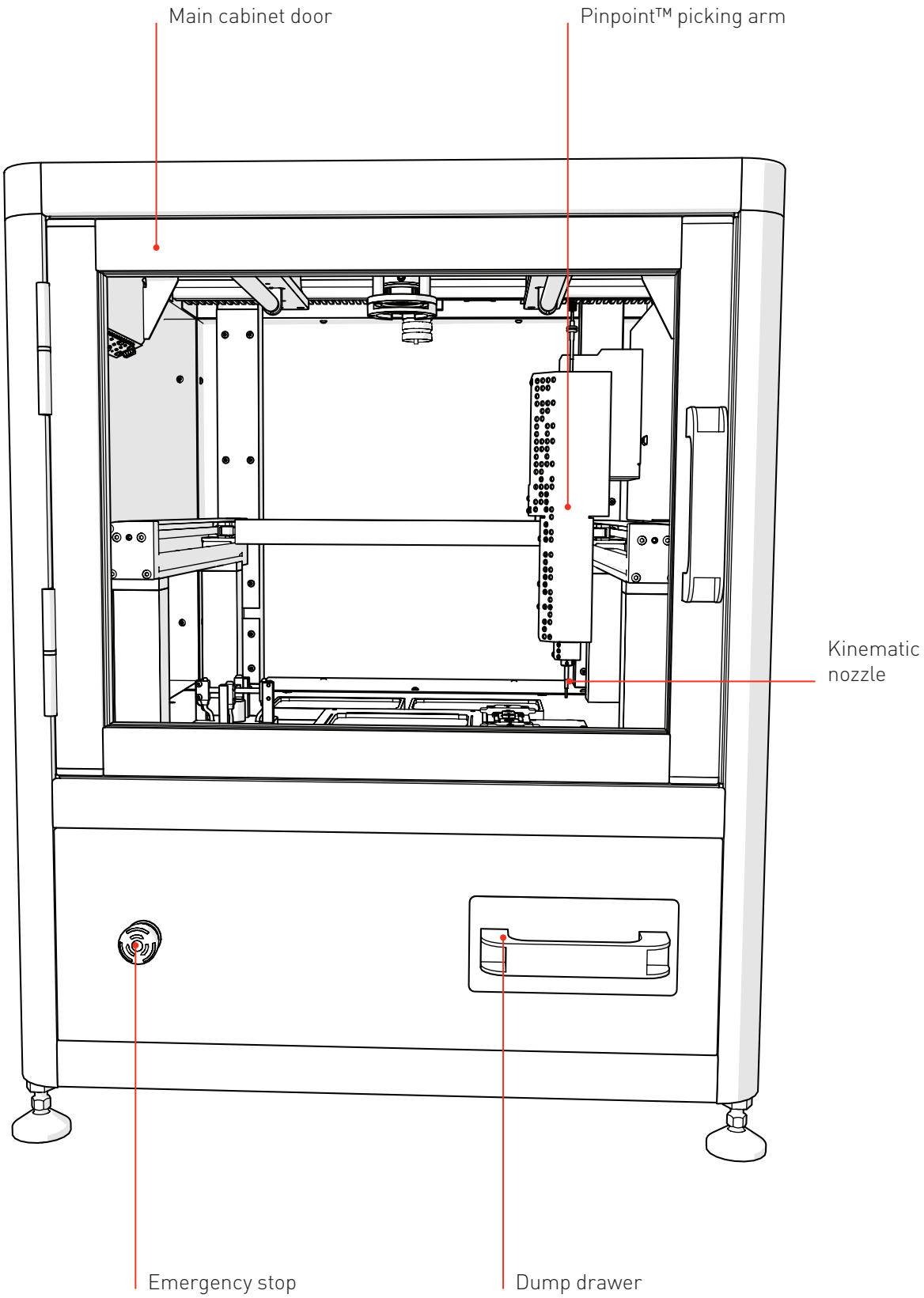
At Singer Instruments, we are constantly seeking to improve our products and adapt them to the requirements of modern research techniques and testing methods. This involves modification to the mechanical structure and optical design of our instruments. Therefore, all descriptions and illustrations in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

The information in this user guide relates to software version: 2.19.126.1

OUT OF THE BOX

Find out what comes with the PIXL. We'll take you through the steps involved in unboxing and assembling ready for picking.

FRONT


Main cabinet door
Pinpoint™ picking arm
Kinematic nozzle
Emergency stop
Dump drawer

CAMERA & LIGHTING

6-channel SpectraStar™ illumination (left and right)

HD camera with filter tray

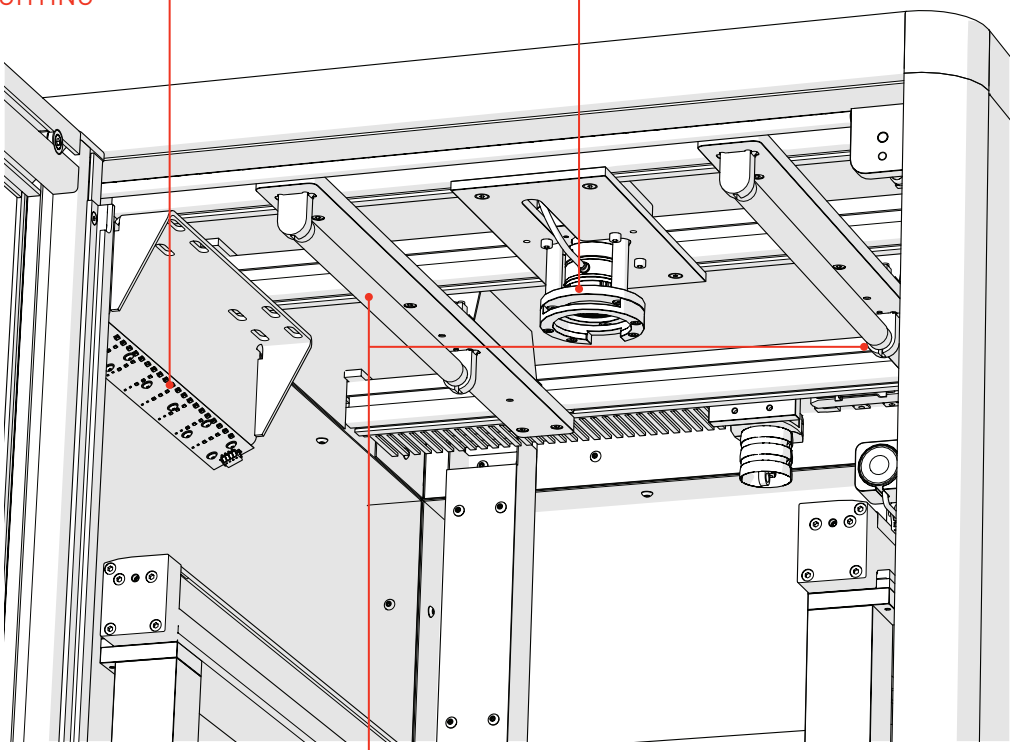


PLATE BAYS

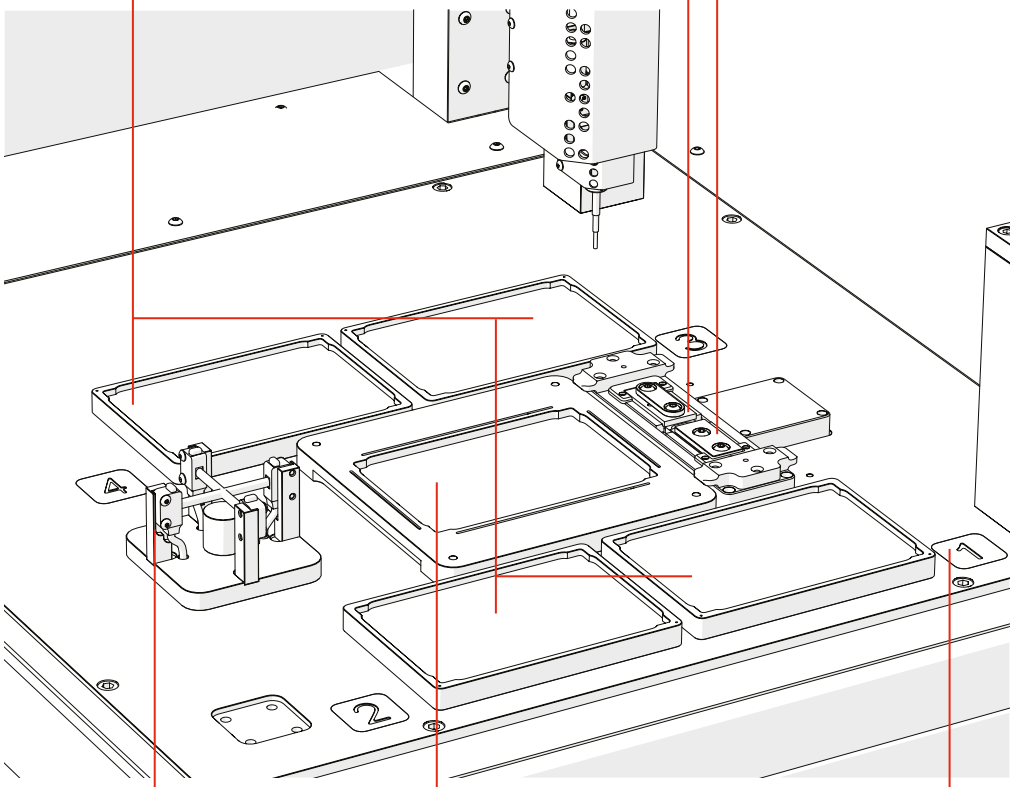
4 x Target bays

2 x UV bulbs

Anvil*

Blade*

*The Anvil and Blade together are referred to as the Cleaver



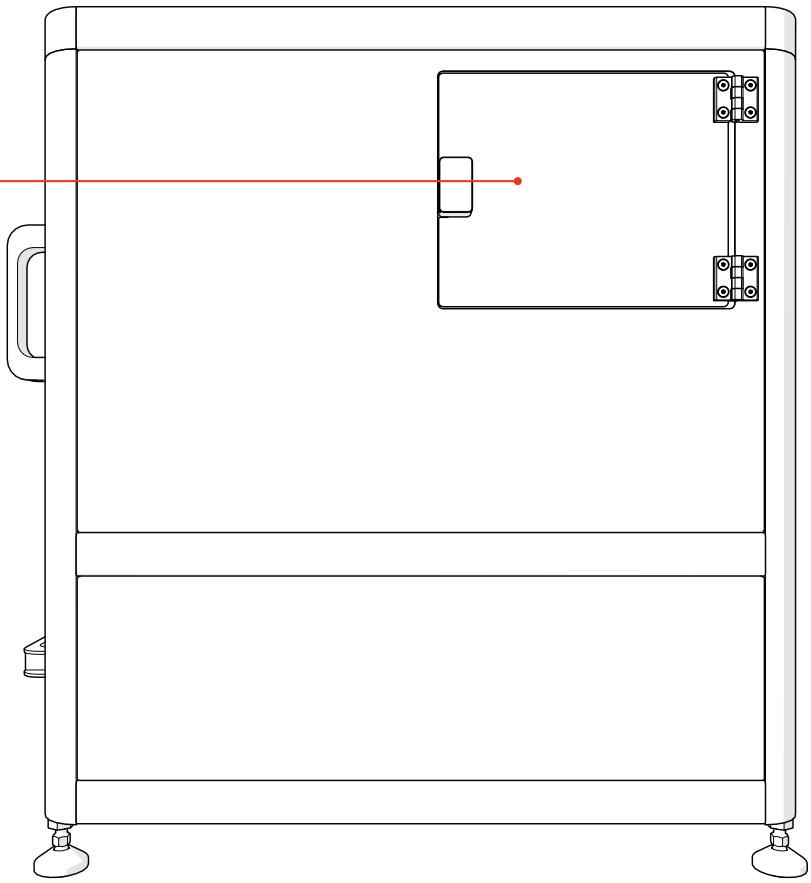
Nozzle calibration sensor

Removable source bay

Colour-coded bay labels

RIGHT

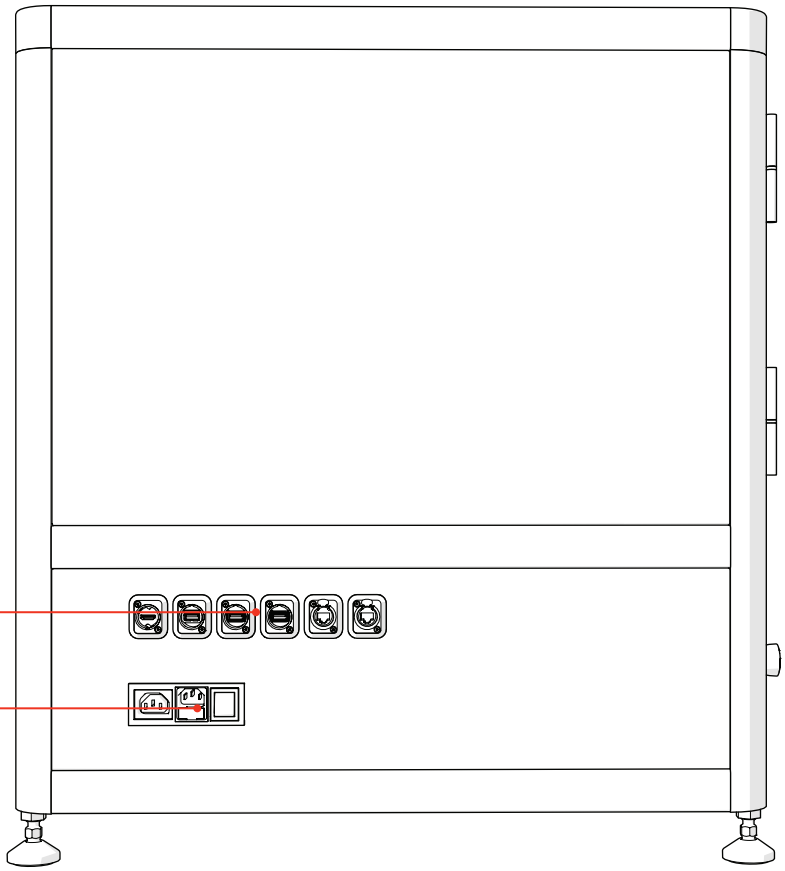
PickupLine™
compartment



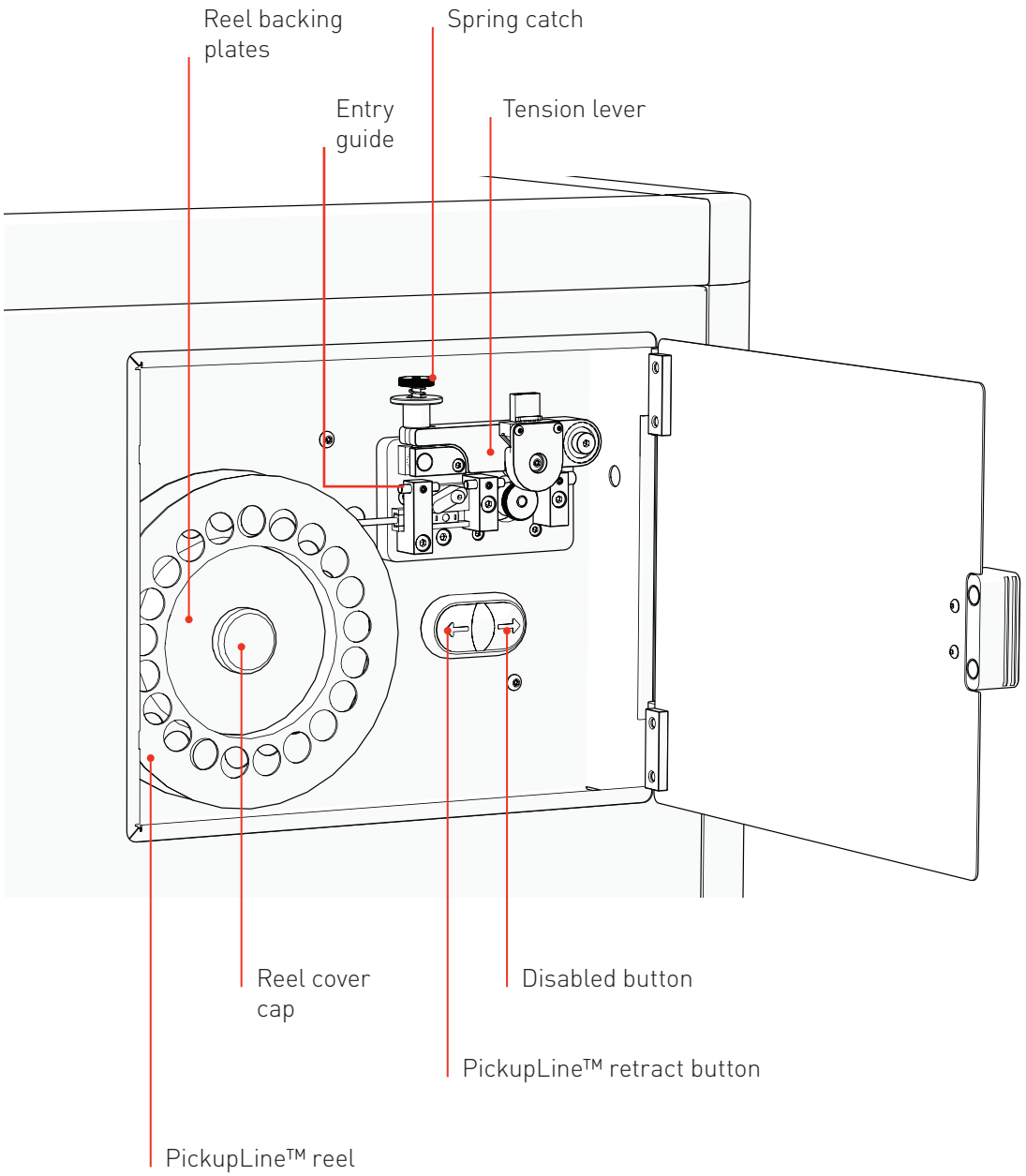
LEFT

Connections:
1 x HDMI
1 x USB 3.0
2 x USB 2.0
2 x RJ45

Power switch



PICKUPLINE™ COMPARTMENT



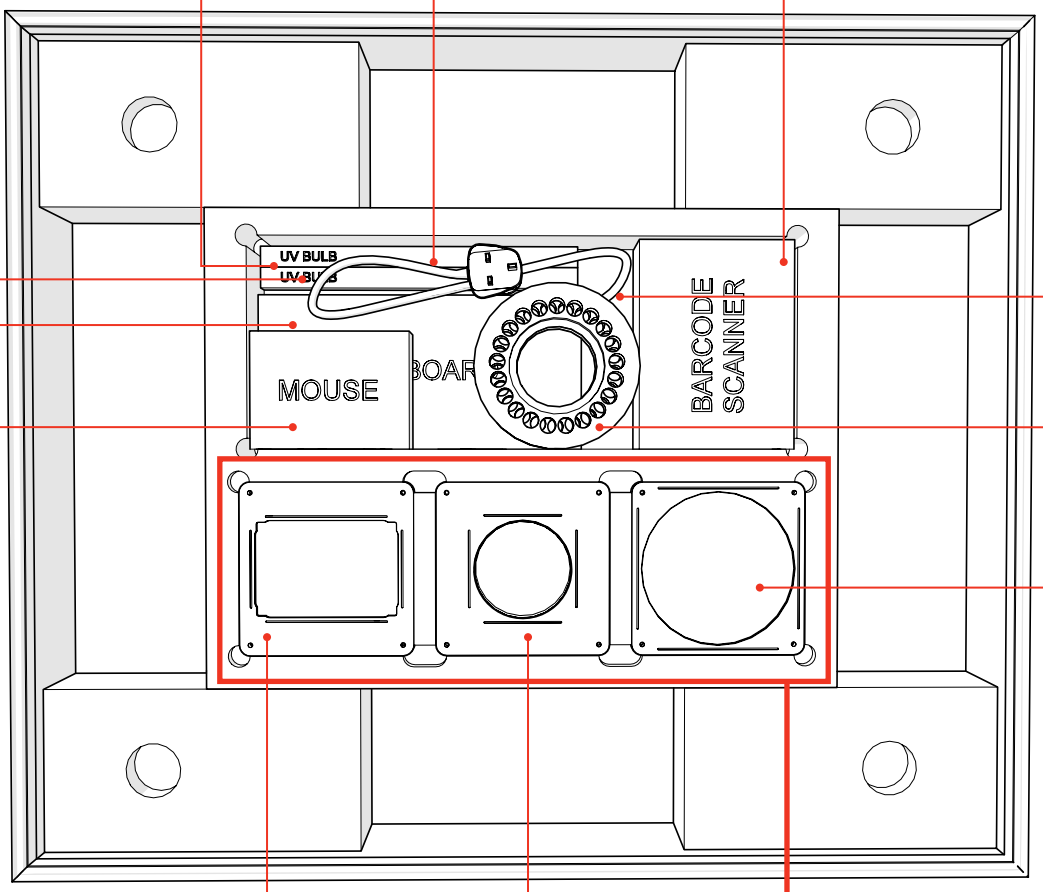
ACCESSORIES

1x 2mm, 2x 2.5mm, 1x 3mm & 1x 4mm hex keys

2 x UV bulbs

Power cable

Barcode scanner *(optional extra)*



Keyboard

Mouse

Ethernet cable

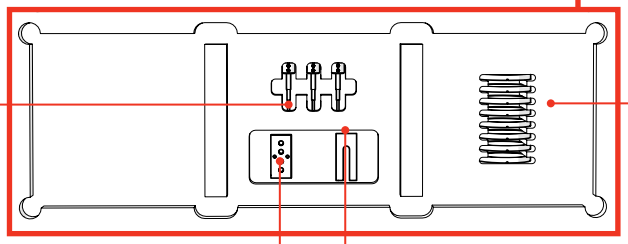
PickupLine™

150mm petri source bay *(optional extra)*

PlusPlate source bay

90mm petri source bay *(optional extra)*

UNDER SOURCE BAYS



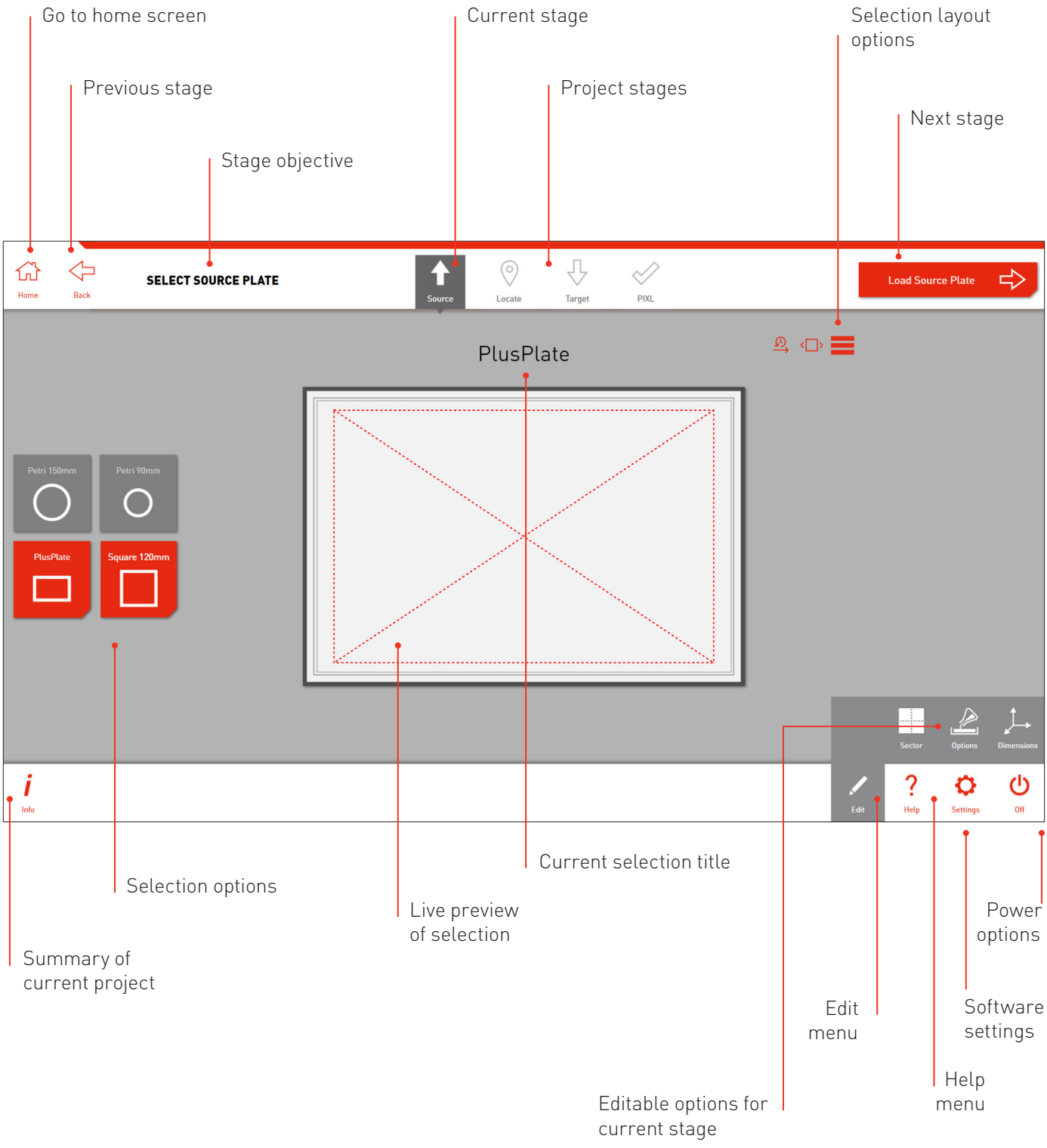
Kinematic nozzle *(plus optional extras)*

Camera filters *(optional extra)*

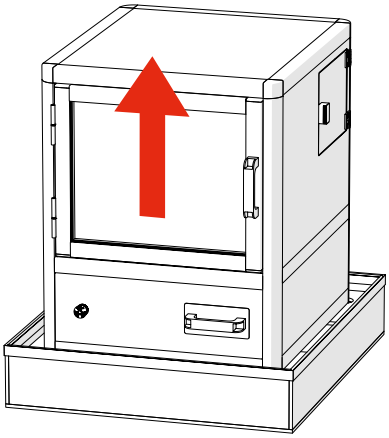
Blade

Anvil

SOFTWARE

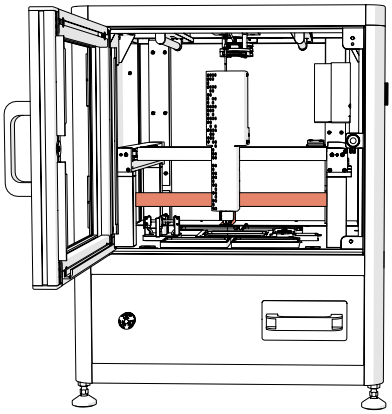

Go to home screen
Previous stage
Stage objective
Current stage
Project stages
Selection layout options
Next stage
Home
Back
SELECT SOURCE PLATE
Source
Locate
Target
PIXL
Load Source Plate
PlusPlate
Petri 150mm
Petri 90mm
PlusPlate
Square 120mm
Sector
Options
Dimensions
Info
Edit
Help
Settings
Off
Selection options
Live preview of selection
Current selection title
Summary of current project
Power options
Edit menu
Software settings
Help menu
Editable options for current stage

1



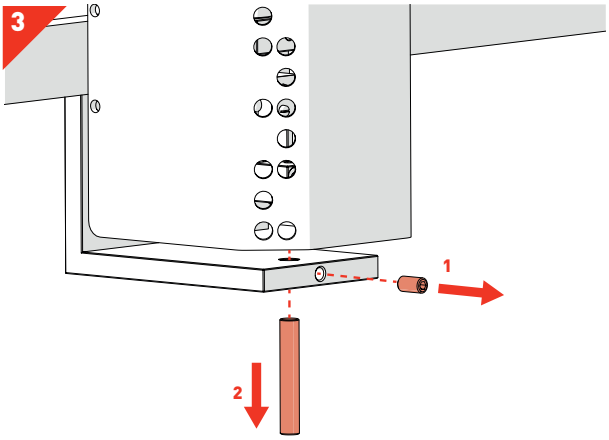
- Remove *Packaging Lid* and carefully lift the PIXL out of the lower case.
- Place on a sturdy desk.
- HEAVY: Minimum of 4 people recommended

2



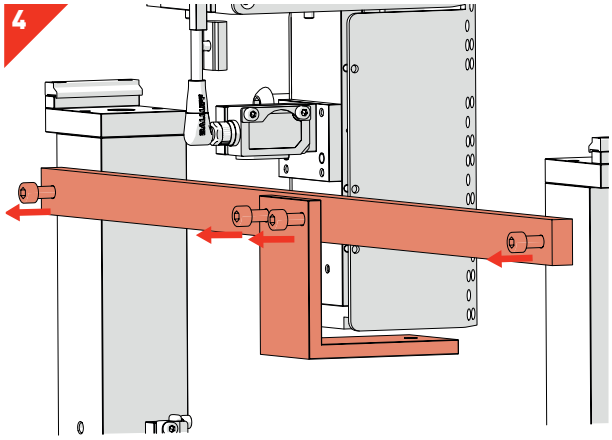
- To remove the *Red Transit Bracket* follow steps 3 and 4 below.

3



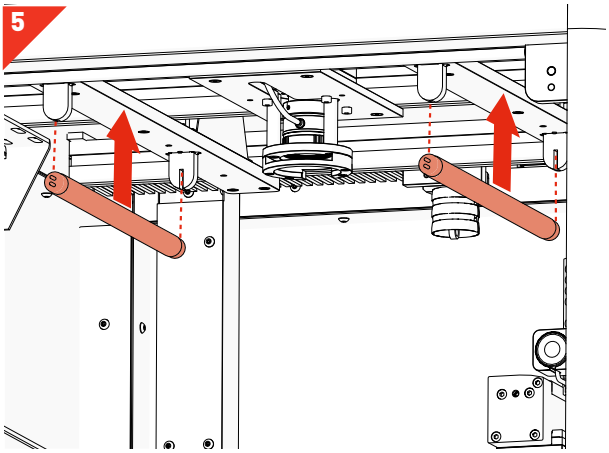
- Use *2mm Hex Key* to undo *Front Screw* (1), then remove *Securing Rod* (2).

4



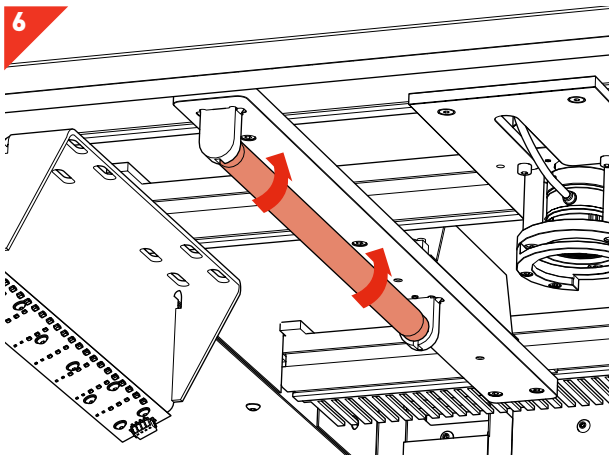
- Use *4mm Hex Key* to undo the 4 *Bracket Screws* behind the transit bracket and carefully remove.

5



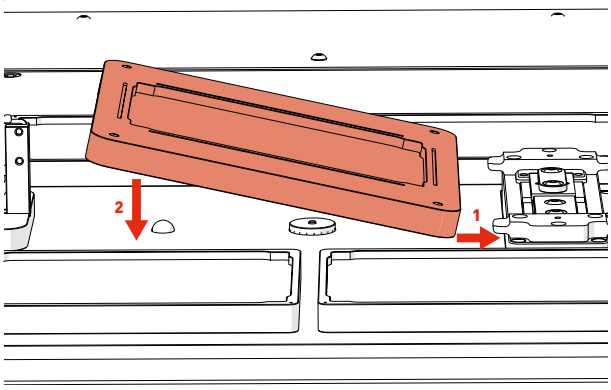
- Remove the 2 *UV Bulbs* from their protective box and slide between the *UV Sockets* attached to the roof of the main cabinet.
- NOTE: Wear gloves.

6



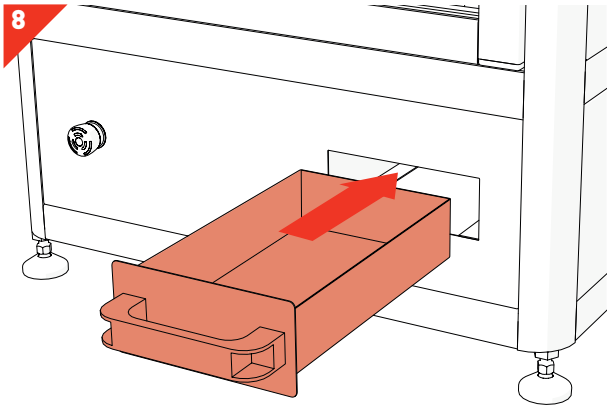
- To lock into place, turn each *UV Bulb* 90 degrees in any direction until you hear a click.

7



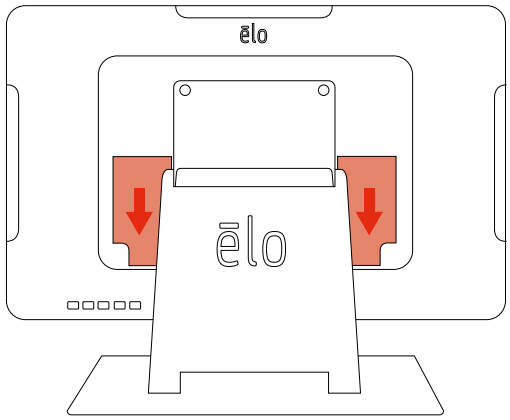
· Install the *Source Bay* by sliding the right side under the *Cleaver Tabs*, then lowering the left side onto the magnetic base.

8



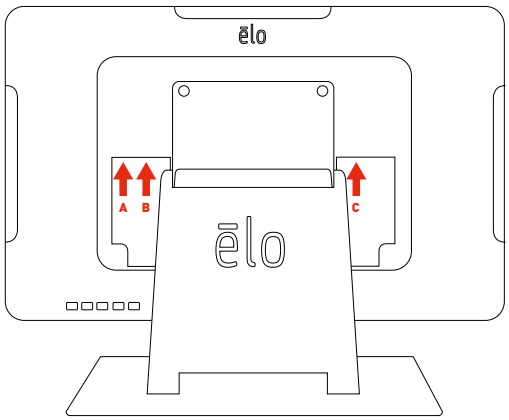
· Ensure the *Dump Drawer* is installed.

9



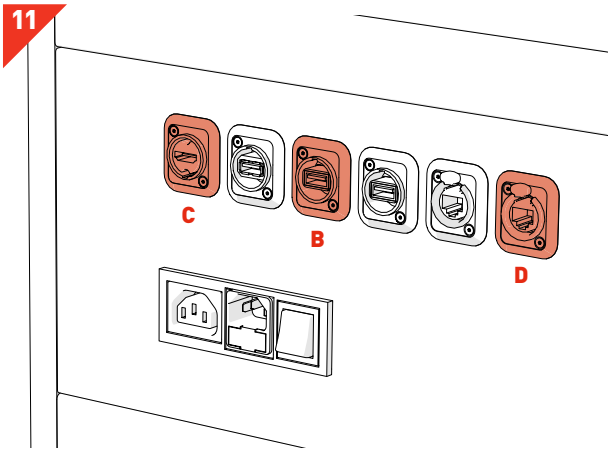
· Set up the *MCI Stand* according to the manufacturer's instructions.
· To gain access to the connection sockets, slide the *Connection Covers* down and remove.

10



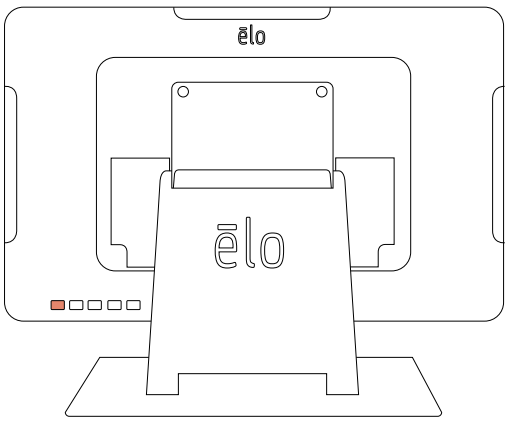
· Plug in the provided MCI cables: *Power (A)*, *USB 2.0 Type-B (B)* and *HDMI (C)*

11



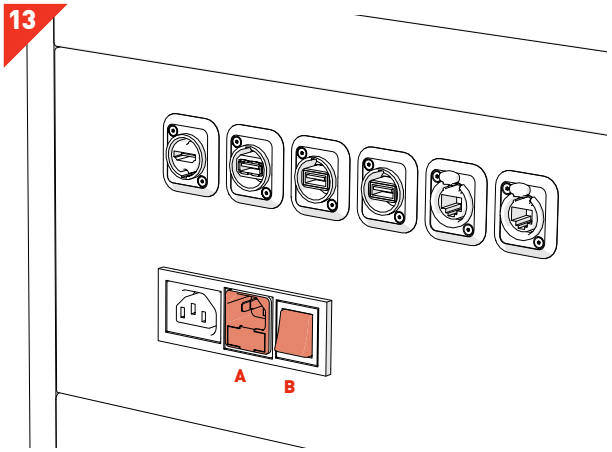
· Connect the MCI to the PIXL: *USB 2.0 Type-A (B)* and *HDMI (C)*.
· Connect an *Ethernet Cable* to the right *RJ45 Socket (D)* for remote access and software upgrades.

12



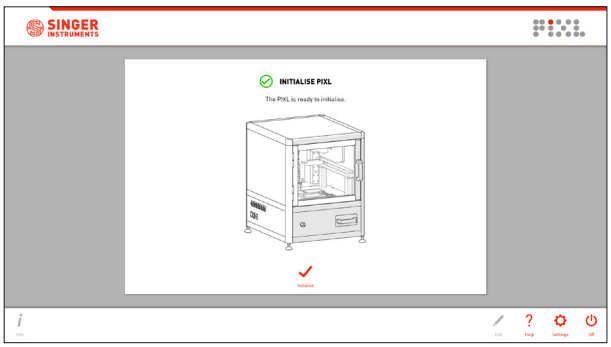
· Turn on the *MCI Power Switch*.

13



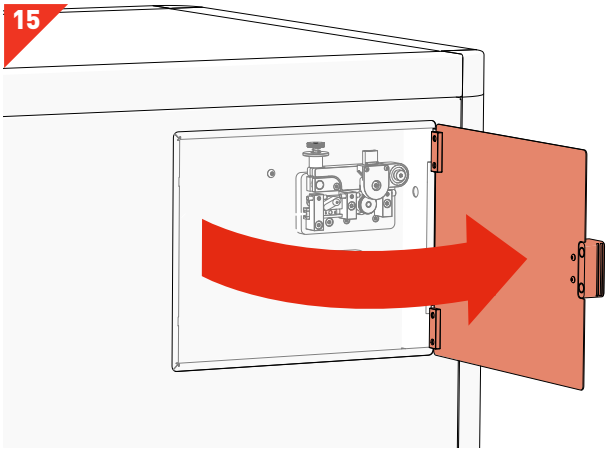
- Plug in the *PIXL Power Cable (A)* and press the *Power Switch (B)*.
- The MCI will also turn on.

14



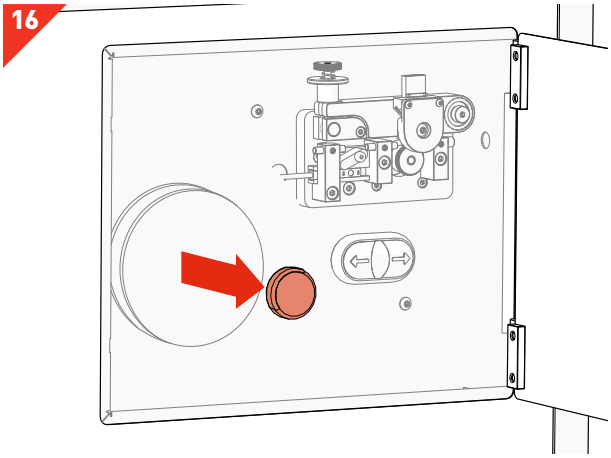
- After initialisation, follow on-screen instructions for PickupLine™ installation.

15



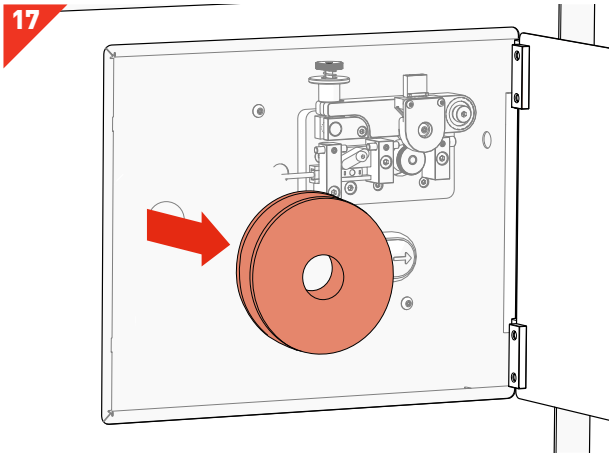
- Open the *PickupLine™ Compartment*.

16



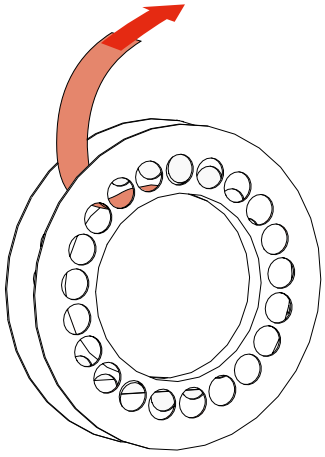
- Remove the *Reel Cap Cover*.

17



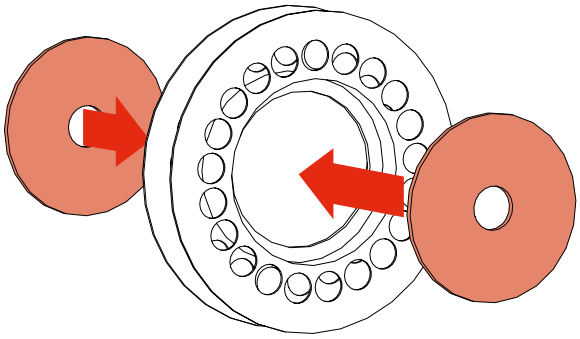
- Remove the *Reel Backing Plates*.

18



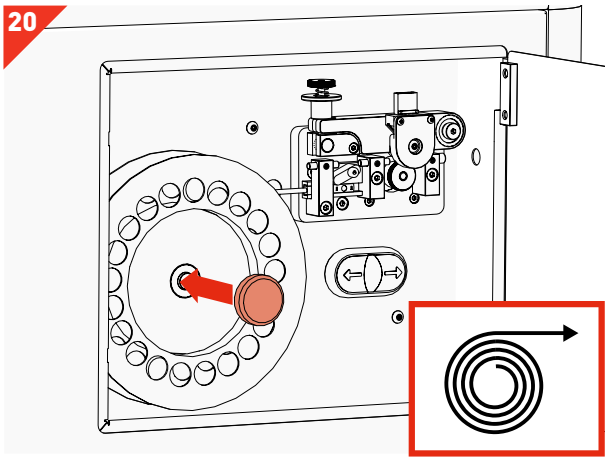
- Remove the new *PickupLine™ Reel* from it's sterile packet and dispose of the *Securing Tape*.

19



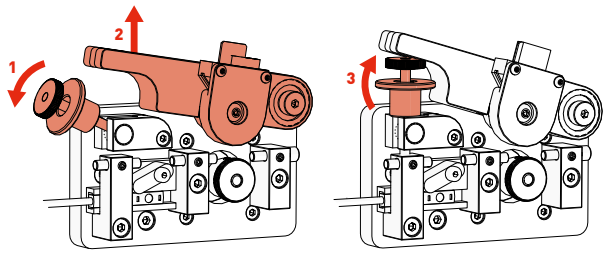
- Fit the *Reel Backing Plates* into new the *PickupLine™ Reel*.

20



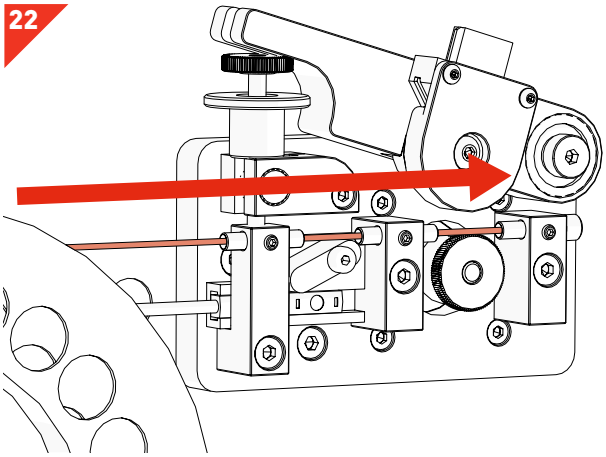
- Fit the new *PickupLine™ Reel* ensuring it feeds in a clockwise direction.
- Replace the *Reel Cap Cover*.

21



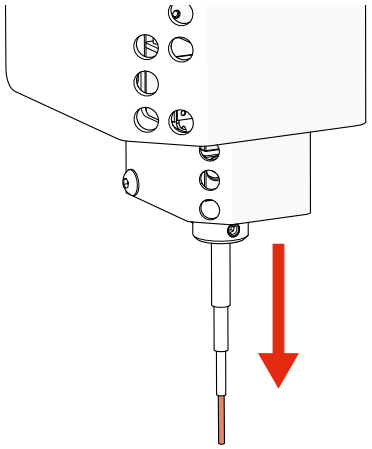
- Carefully lift the *Tension Lever* and rest it on the *Spring Catch* as shown.

22



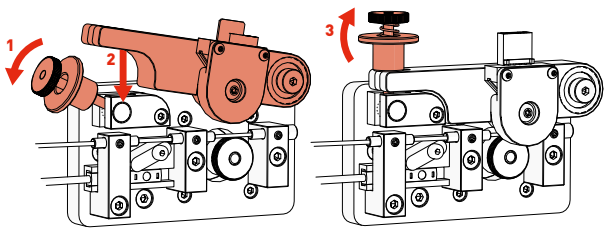
- Gently feed the *PickupLine™* by hand through the 3 *Entry Guides*. The PickupLine™ is sterilised at the nozzle but for extra sterility gloves should be worn.
- If you meet resistance, pull back slightly and re-feed.

23



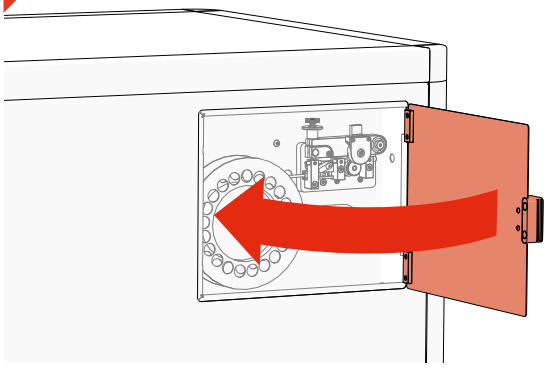
- Feed the *PickupLine™* until it protrudes 10mm from the *Kinematic Nozzle*.

24



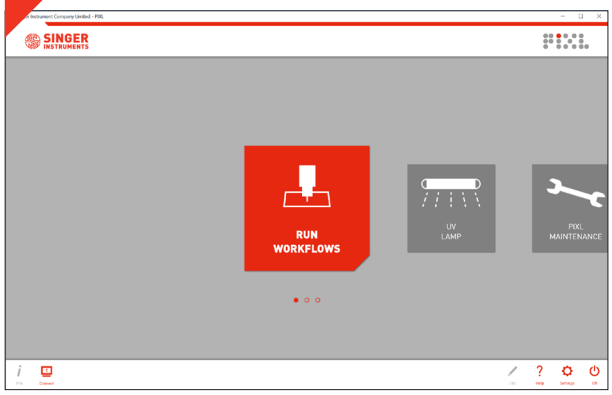
- Reset the *Tension Lever*.

25



· Close the *PickupLine™ Compartment*.

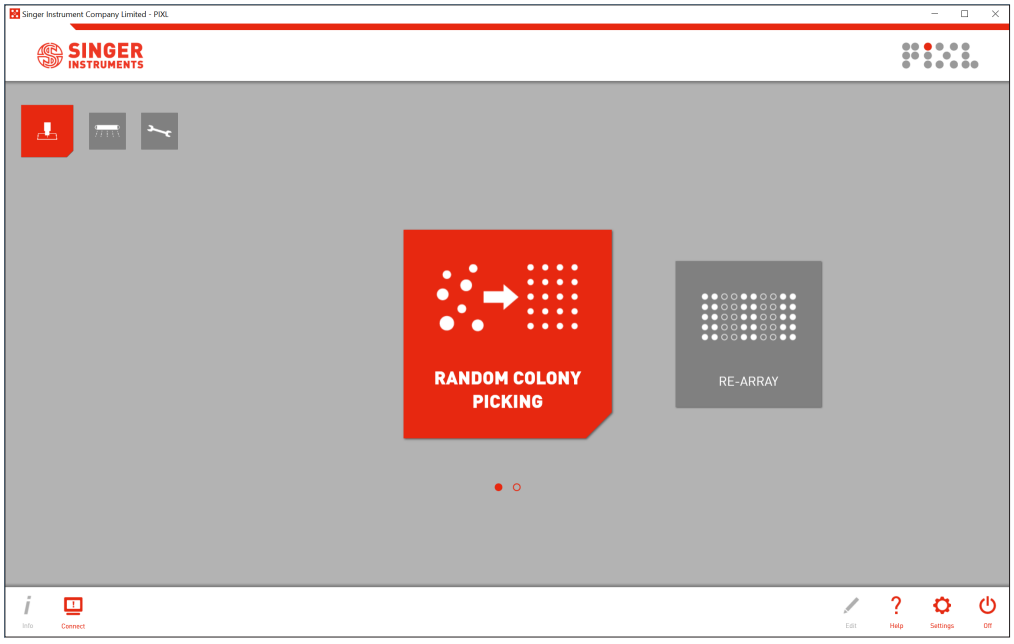
26



· Boom! You're ready to PIXL!

RANDOM COLONY PICKING

Let's take a quick tour of the Random Colony Picking program to get you started with PIXL. Click *Run Workflows* then select *Random Colony Picking*.



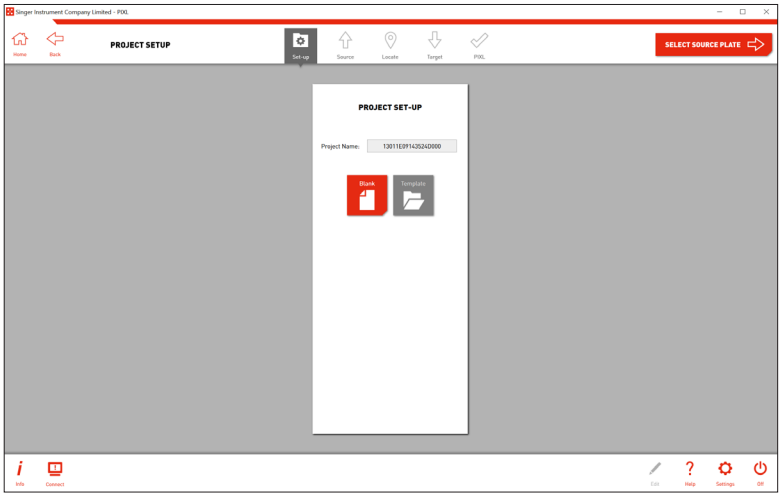
RANDOM COLONY PICKING OVERVIEW

1

- During project setup you can name your project and select from 3 workflow options:
  Blank - Start a new project and select settings as you step through the software.
  Last used - Select the settings you last used and proceed to plate loading.
  Template - Select from a list of pre-made template settings and proceed to plate loading.

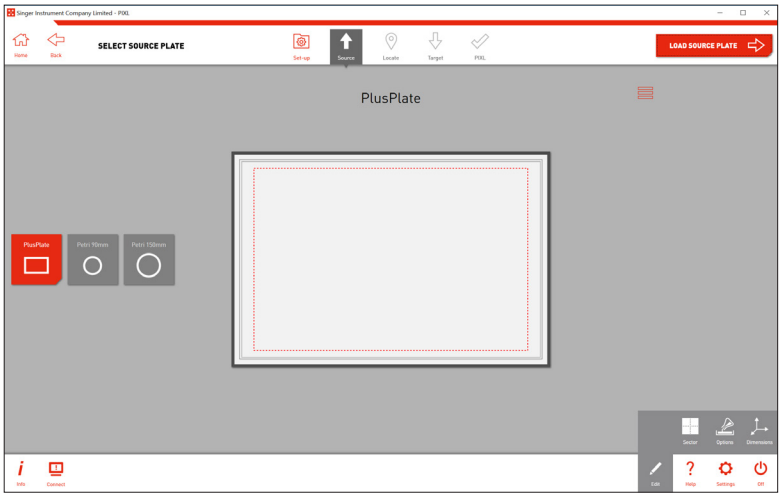
- The first time you use the software you will only have the option to use a blank project. Learn how to save a template on page 49.

- Click the *Select Source Plate* → button to move to the next stage.



2

- Select the type of source plate that you plan on using. This is the plate you want to pick from.

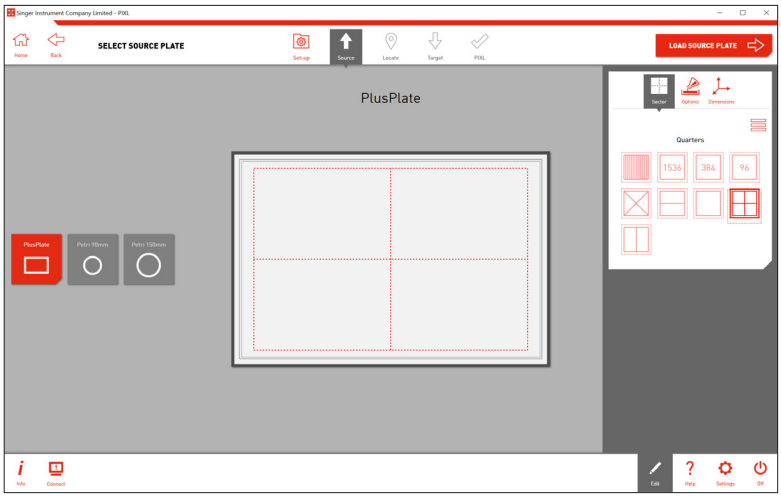


3

- Use the *Edit Options* on each stage to add detailed settings to your plate.

- At this stage you can add sectors to your plate or add specific dimensions/agar depth.

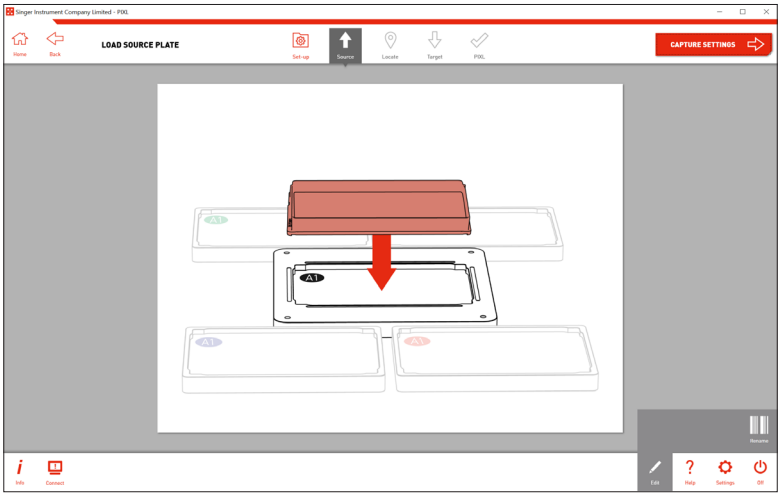
- Click the *Load Source Plate* → button to move to the next stage.



RANDOM COLONY PICKING OVERVIEW

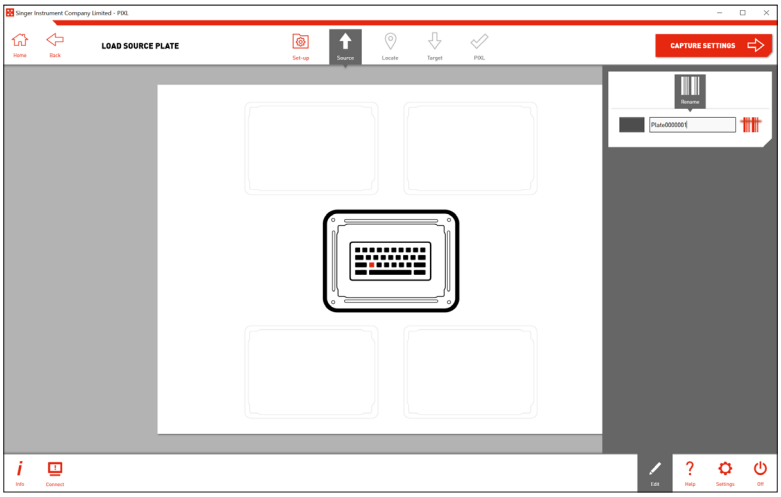
4

- Remove the lid and load your *Source Plate* into the *Source Plate Bay*, as shown on-screen.
- NOTE: If you have the incorrect source plate bay installed, simply switch it out for the correct one. The source plate bays attach via magnets so can be switched in seconds. Follow instructions on page 46.



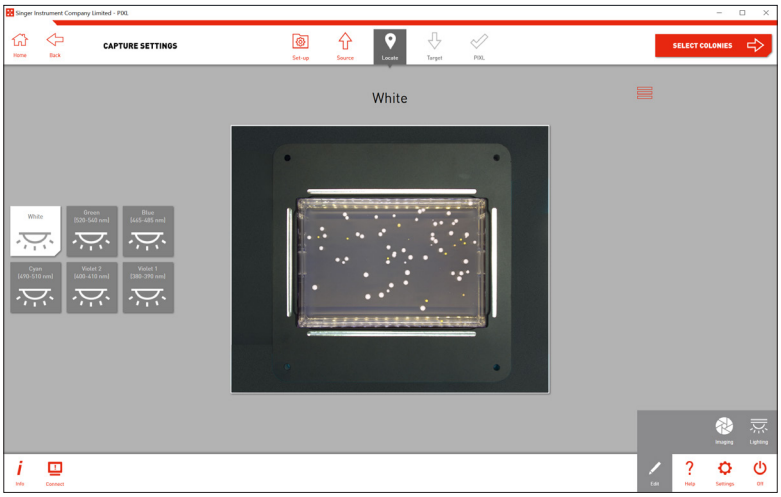
5

- Use the *Rename Option* in the edit menu to scan a barcode or manually add a name to your plate.
- Click the *Capture Settings* → button to move onto the next stage.

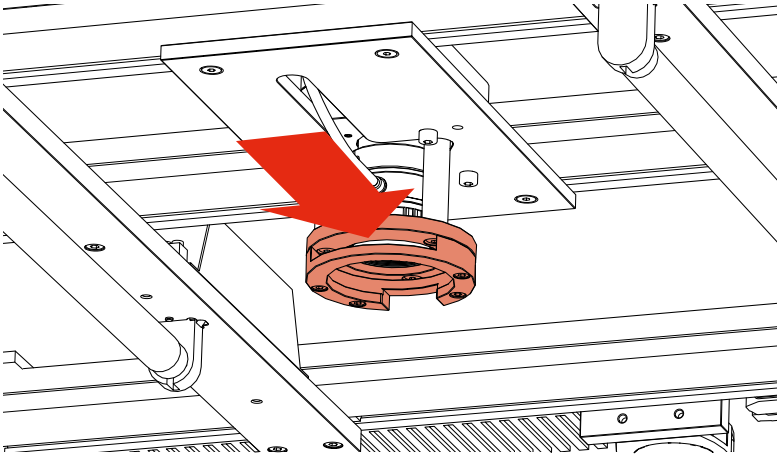


6

- Select one of the 6 lighting channels. The wavelengths are listed on-screen.
- Use the *Imaging Option* in the edit menu to adjust the camera settings if necessary.
- Click the *Select Colonies* → button to move on.

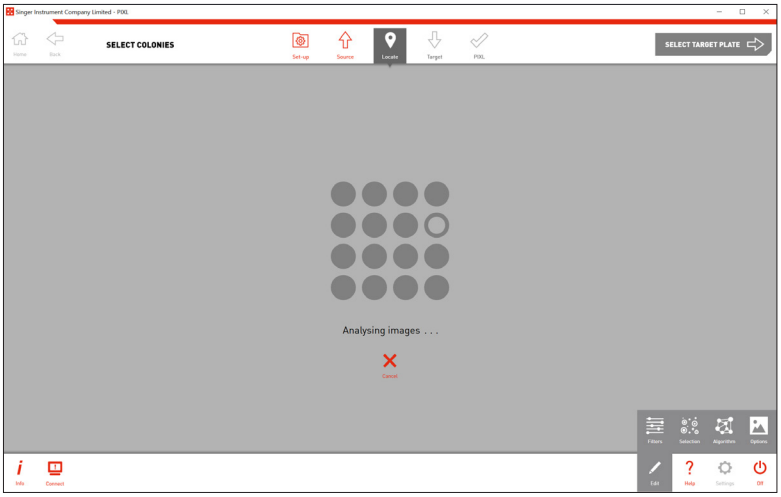


7



- If a camera filter is required, place it into the camera's *Filter Tray* before moving to the Select Colonies stage. Detailed instructions can be found on page 47.

8



- PIXL will now analyse the image to detect the colonies.

9

- You can see how many colonies are detected and, of those, how many are selected for picking.

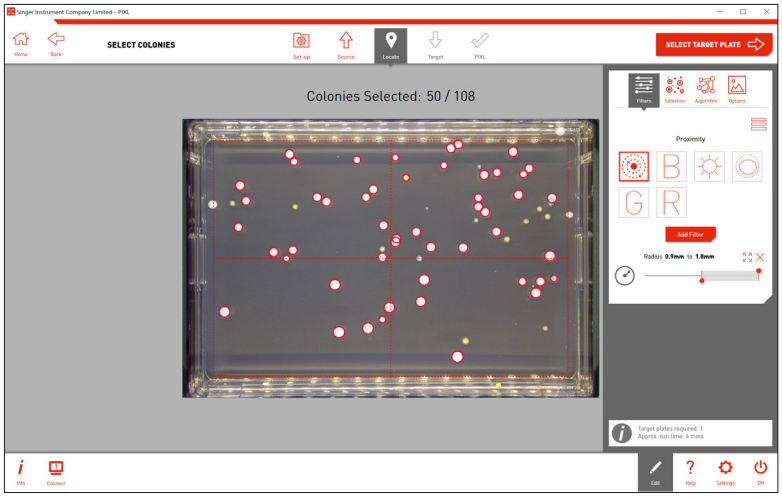
- The edit menu has 4 options:
  Filters - Filter your picking selection by: proximity, intensity, colour, circularity and area.
  Selection - Choose how many colonies you want to pick from each sector and what parameters to choose them by.
  Algorithm - Select detection based on organism.
  Options - Choose how to view your preview plate image.

- Manually deselect colonies by clicking on them.

RANDOM COLONY PICKING OVERVIEW

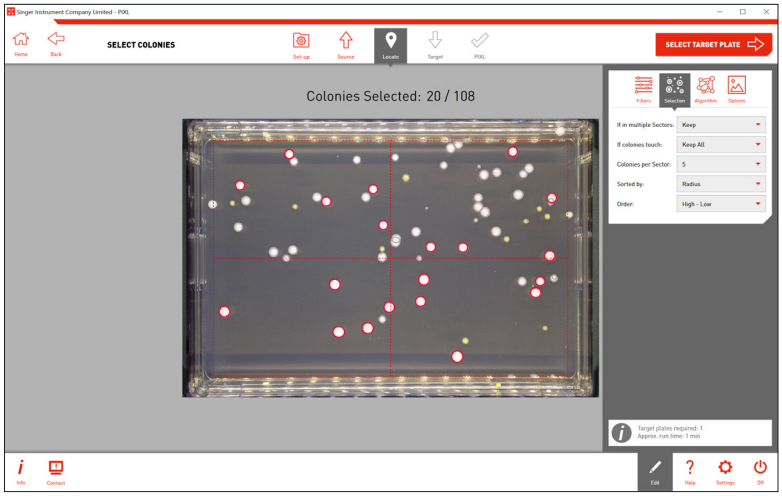
10

- Use the *Filters Options* in the edit menu to select colonies within desired parameters.



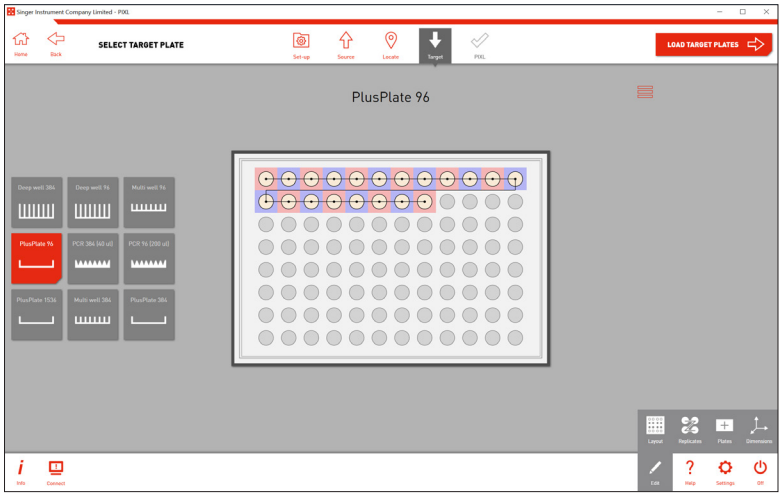
11

- Colony selection can be narrowed down even further by using the *Selection Options*.
- Click the *Select Target Plate* → button to move to the next stage.



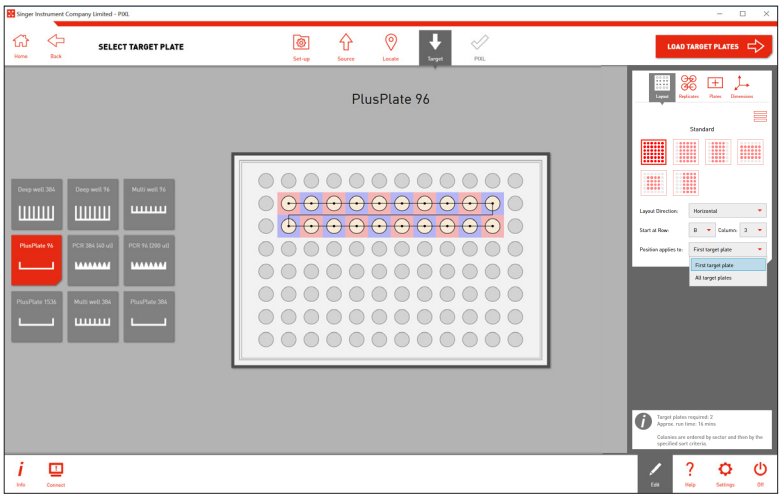
12

- Select the type of target plate that you plan on using. This is where you will deposit your colonies.
- The edit menu has 4 options:
  Layout - Exclude rows or columns.
  Replicates - Choose how many copies of each colony you want to pin.
  Plates - Select any copies you want to make of each target plate.
  Dimensions - Enter detailed dimensions of your plate or choose from a list.



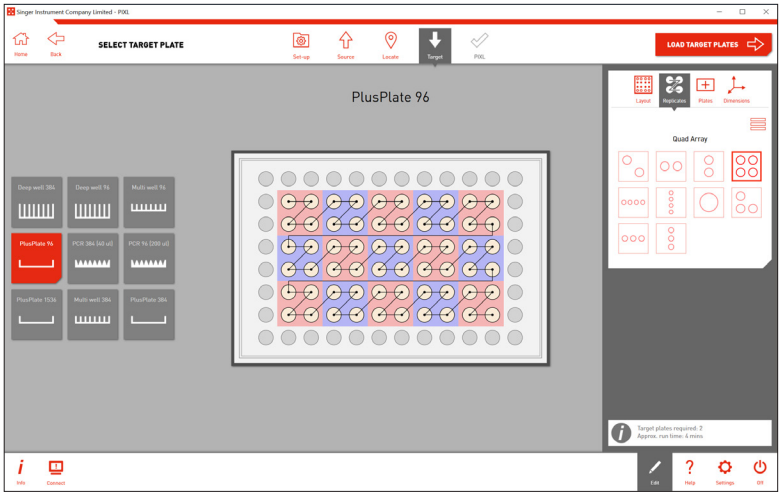
13

- With the *Layout Options* in the edit menu you can exclude rows or columns on your plate from being pinned into.
- You can also select the start row/column position and apply this to all of your target plates or just the first.



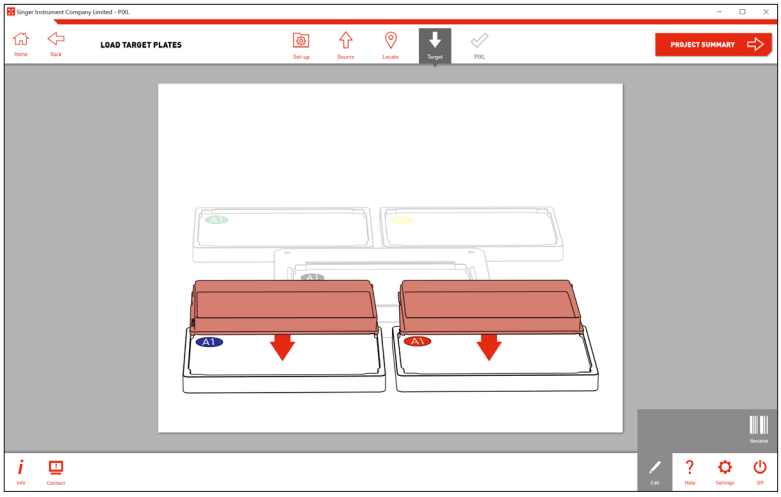
14

- With the *Replicates Options* in the edit menu you can set the number of colony replicates as well as how they're laid out on the plate.
- Click the *Load Target Plate* → button to move to the next stage.



15

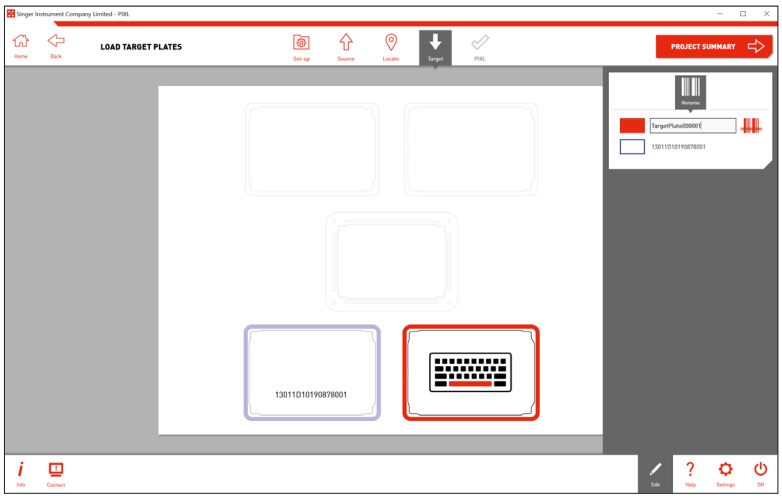
- Remove the lid and load your *Target Plate(s)* into the *Target Plate Bay(s)*, as shown on-screen.
- Plates can be renamed in the edit menu.



RANDOM COLONY PICKING OVERVIEW

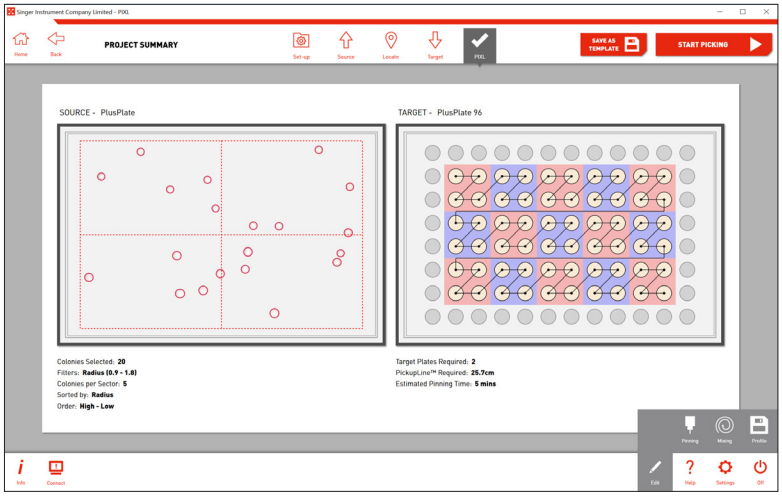
16

- Use the *Rename Option* in the edit menu to scan a barcode or manually add a name to your plate.
- Click the *Project Summary* → button to move onto the next stage.



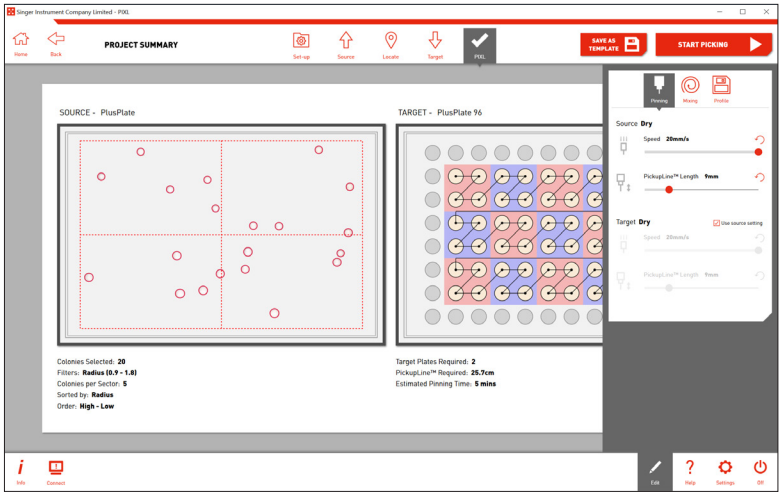
17

- Here is a summary of your pinning routine. For full details of your routine click the *Info Button* in the bottom left.
- If necessary, use the *Edit Menu* to change the pinning and mixing settings.



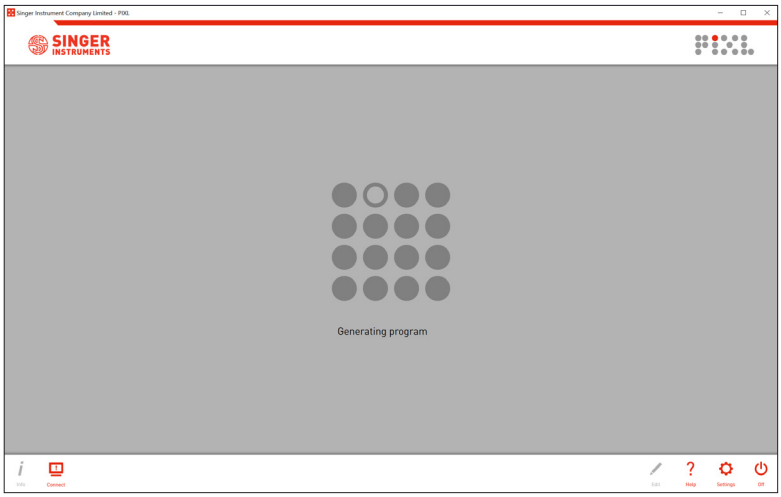
18

- To edit the PIXL pinning and mixing settings, use the options in the edit menu as show.
- These options can be saved as a profile and recalled for future projects. See page 44.
- At this stage you can also save all of your project settings as a template by clicking Save as Template. Detailed instructions can be found on page 49.
- When you're happy, press *Start Picking* › to initiate the picking program.



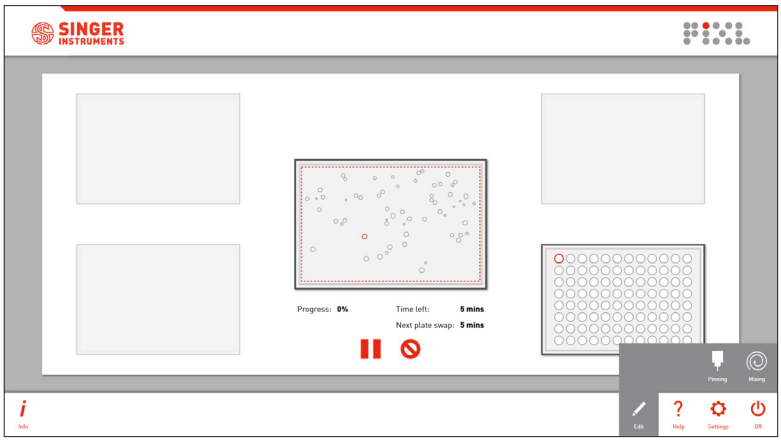
19

- The software will take a few moments to generate the picking program.



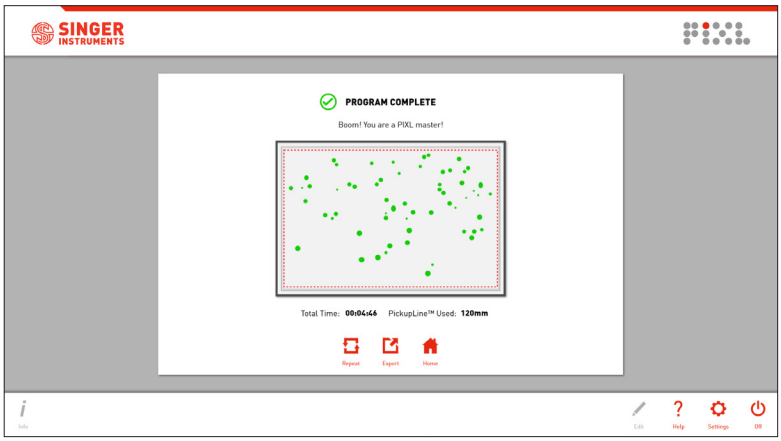
20

- The pinning summary screen shows you the current progress of the pinning routine.
- If the routine requires more than 4 target plates you will be notified when you need to swap in some fresh target plates.
- You can pause or abort the program, or edit the pinning and mixing options mid routine.



21

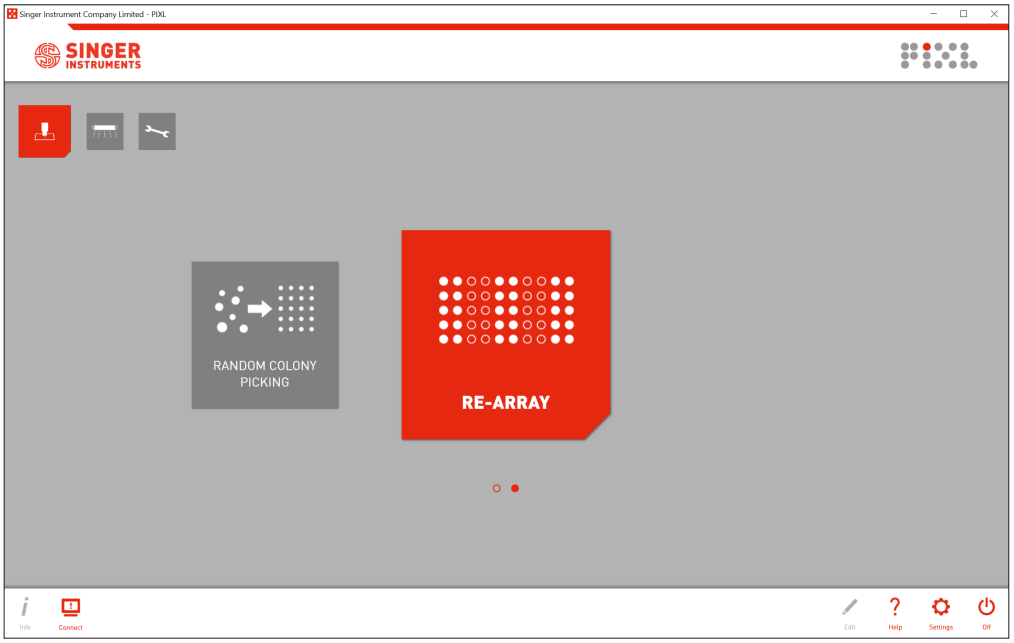
- Once the pinning routine has finished, the summary screen will highlight any unsuccessful pins.
- Use the *Export* option to view all exported colony, routine information and templates for Re-arraying.
- To repeat the same routine click the *Repeat* button.



RE-ARRAY

The Re-array workflow allows you to pick colonies from user defined locations and place them to user defined positions.

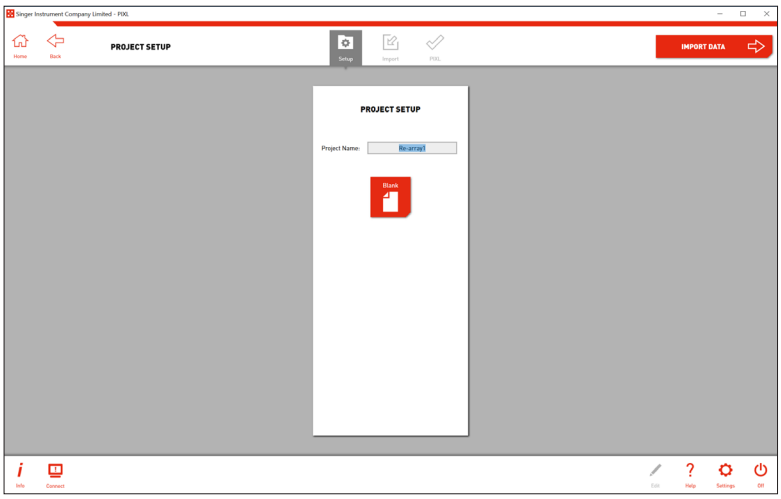
Let's take a look! Click *Run Workflows* then select *Re-array*.



RE-ARRAY OVERVIEW

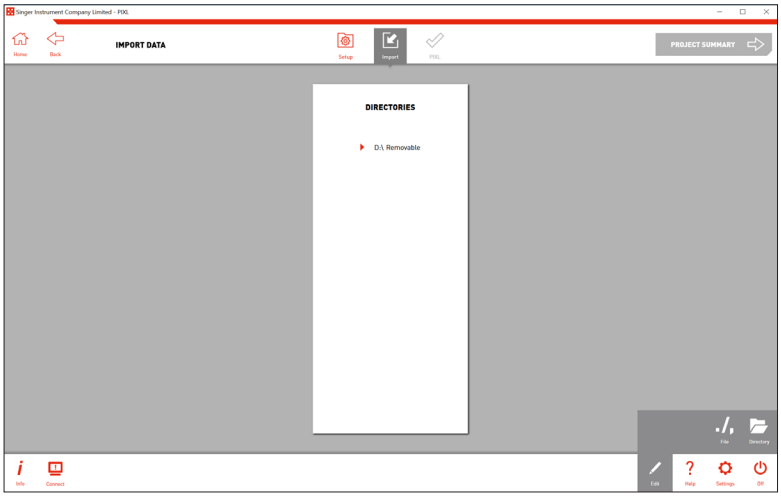
1

- During project setup you can name your project
- Click the *Import Data* → button to move to the next stage.



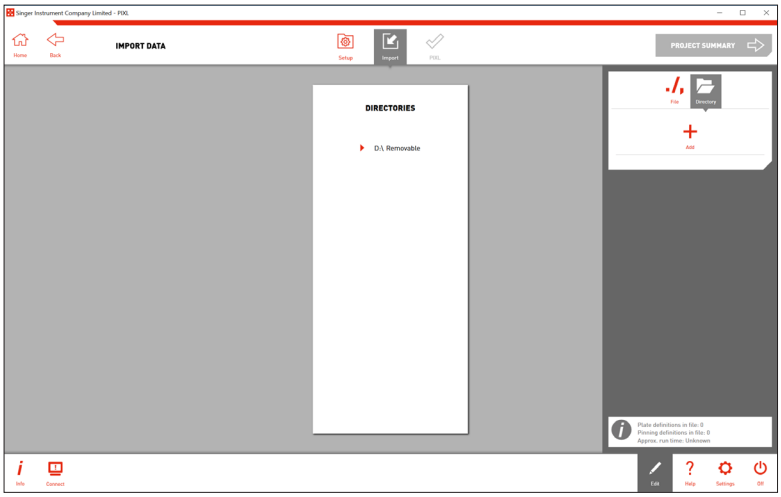
2

- Select the location of your re-arraying file from the directories list.
- Removable storage drives are shown automatically but specific folders on the PIXL will need to be added using the edit menu, as shown in step 3.



3

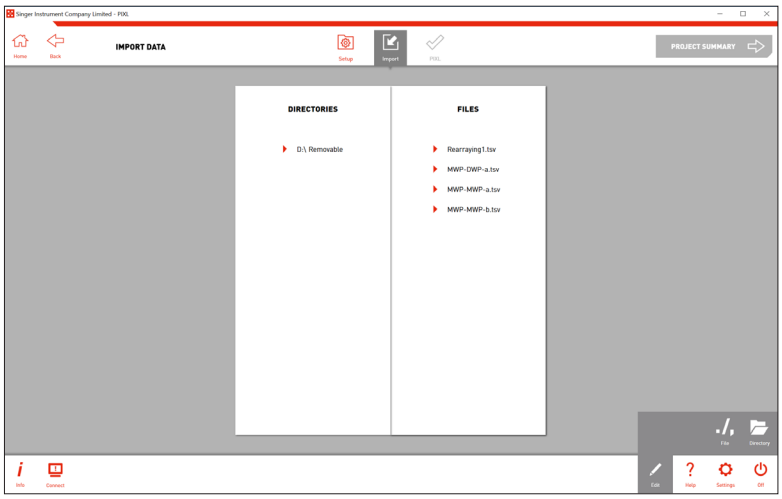
- Open the directories window in the edit menu and click *Add* to add a new file location.
- You can also edit the file settings from here.



RE-ARRAY OVERVIEW

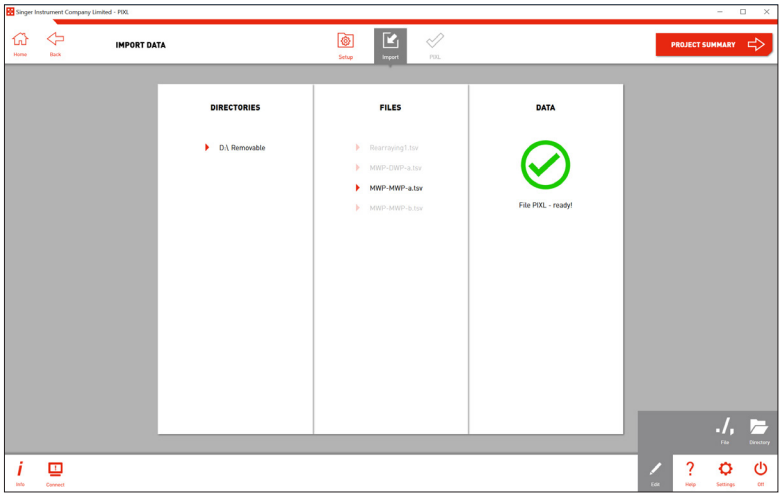
4

- Click you your chosen directory to view the compatible files from that location
- Re-array templates are created with all Random Colony Picking and Colony Detection export files. To learn how to edit export templates and create files for re-arraying, see page 56.



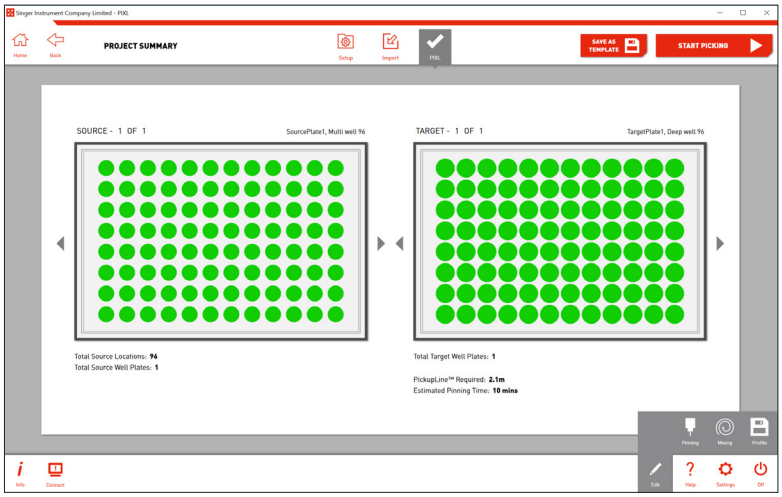
5

- Click on your chosen file and PIXL will check for errors. Any errors will be listed.
- If the file is error-free, click the *Project Summary* → button to move to the next stage.



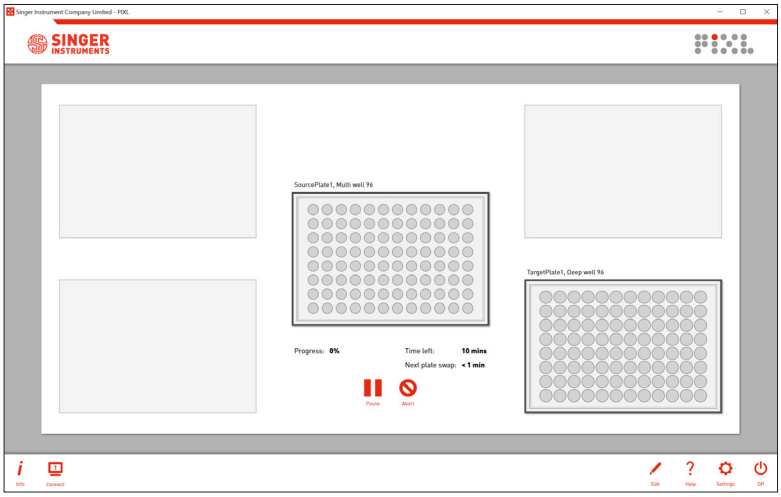
6

- Here is a summary of your pinning routine. For full details of your routine click the *Info Button* in the bottom left.
- If necessary, use the *Edit Menu* to change the pinning and mixing settings.
- Click the *Start Picking* → button to initiate the re-arraying program.



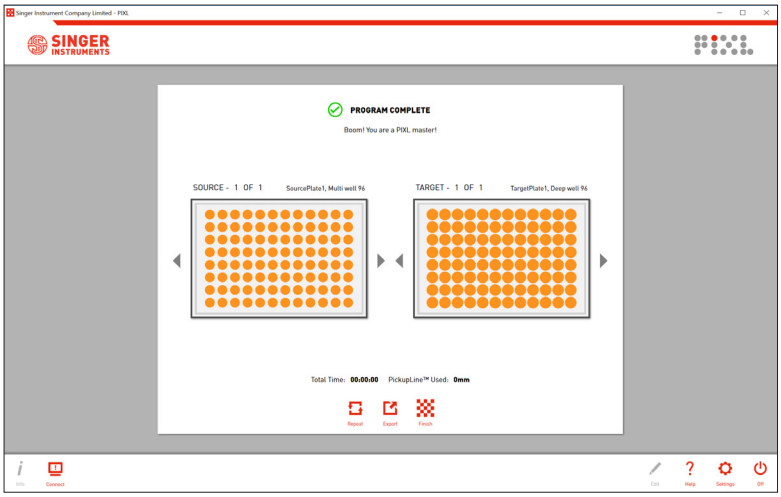
7

- The pinning summary screen shows you the current progress of the pinning routine.
- If the routine requires more than 4 target plates you will be notified when you need to swap in some fresh target plates.
- You can pause or abort the program, or edit the pinning and mixing options mid routine.



8

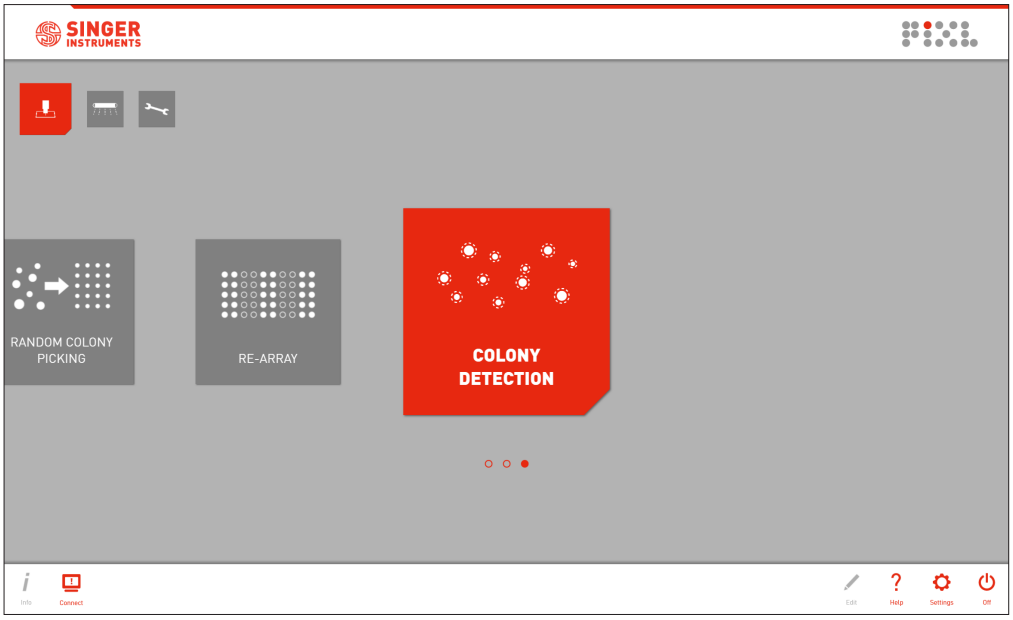
- Once the pinning routine has finished, the summary screen will highlight any unsuccessful pins.
- Use the *Export* option to export all colony and routine information.
- To repeat the same routine click the *Repeat* button.
- *Finish* will take you back to the workflows menu.



COLONY DETECTION

The Colony Detection workflow allows you to quickly image a plate and export the colony positions without having to pick from it.

Let's take a look! Click *Run Workflows* then select *Colony Detection*.



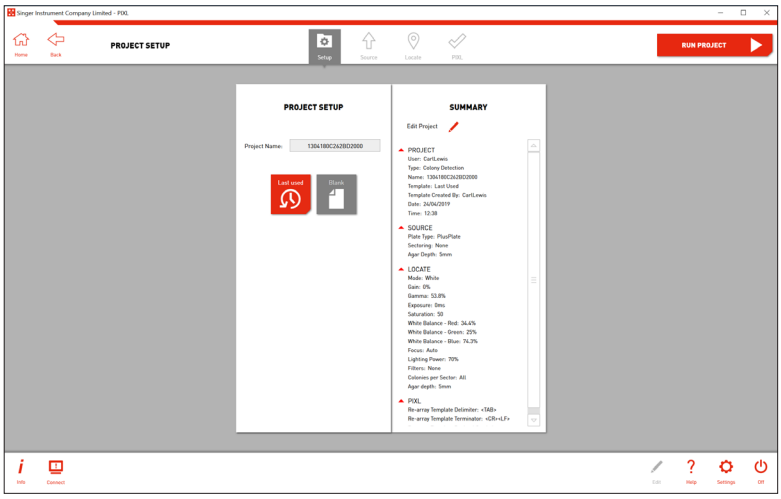
COLONY DETECTION OVERVIEW

1

- During project setup you can name your project and select from 3 workflow options:
  Blank - Start a new project and select settings as you step through the software.
  Last used - Select the settings you last used and proceed to plate loading.
  Template - Select from a list of pre-made template settings and proceed to plate loading.

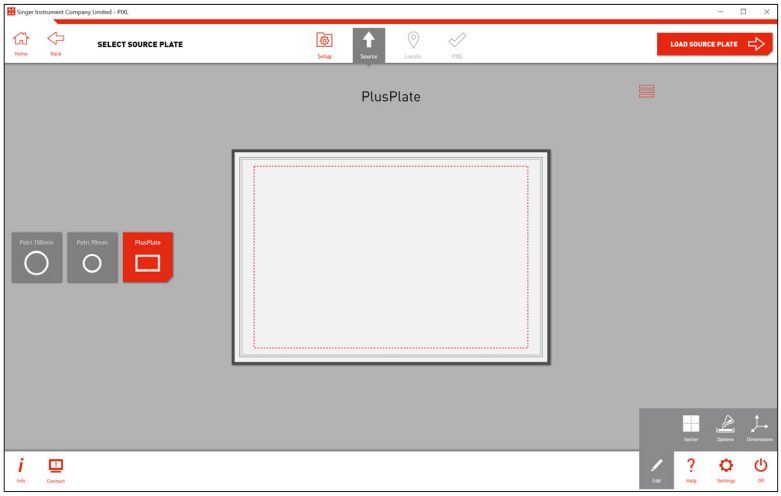
- The first time you use the software you will only have the option to use a blank project. Learn how to save a template on page 49.

- Click the *Select Source Plate* → button to move to the next stage.



2

- Select the type of source plate that you plan to image.

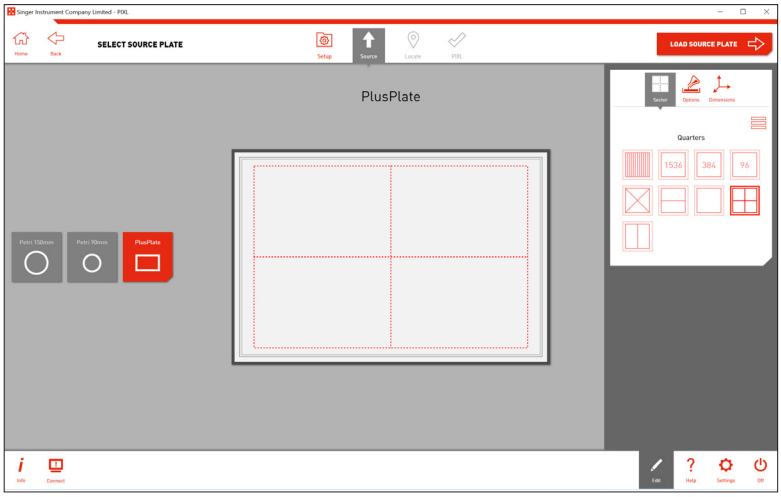


3

- Use the *Edit Options* on each stage to add detailed settings to your plate.

- At this stage you can add sectors to your plate or add specific dimensions/agar depth.

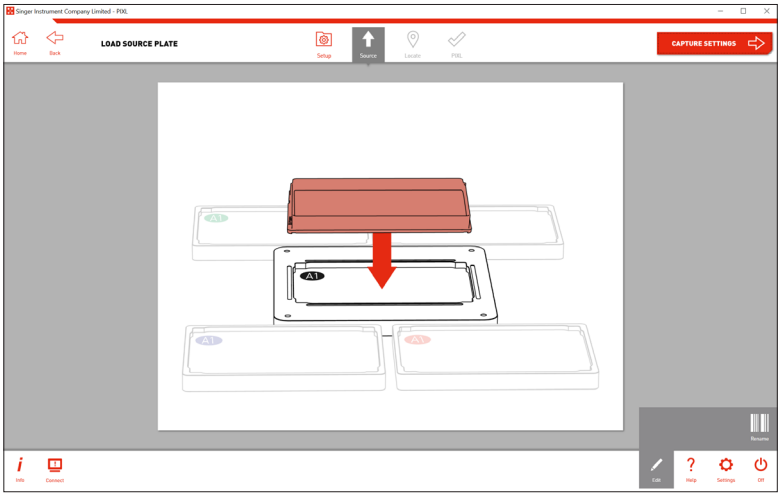
- Click the *Load Source Plate* → button to move to the next stage.



COLONY DETECTION OVERVIEW

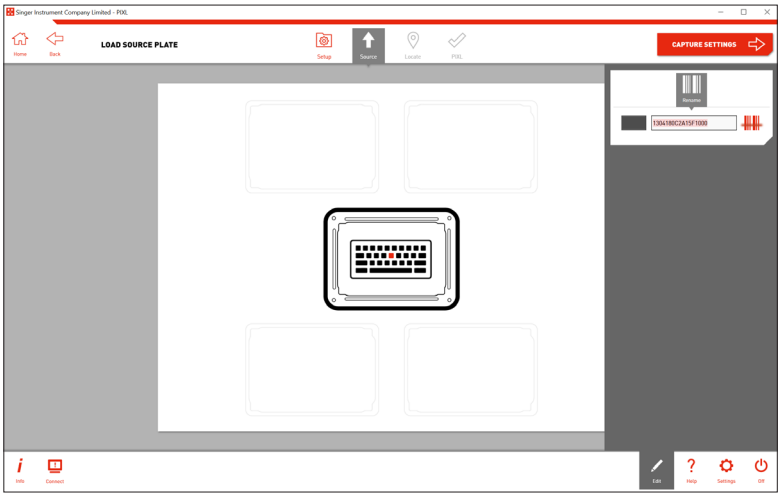
4

- Remove the lid and load your *Source Plate* into the *Source Plate Bay*, as shown on-screen.
- NOTE: If you have the incorrect source plate bay installed, simply switch it out for the correct one. The source plate bays attach via magnets so can be switched in seconds. Follow instructions on page 46.



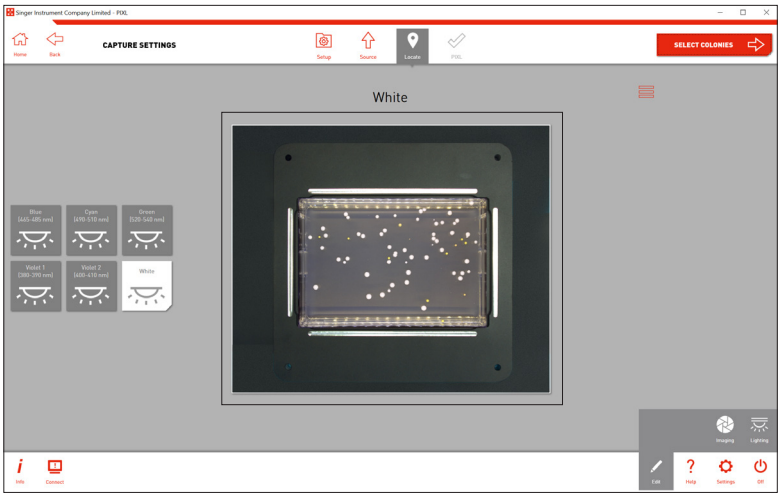
5

- Use the *Rename Option* in the edit menu to scan a barcode or manually add a name to your plate.
- Click the *Capture Settings* → button to move onto the next stage.



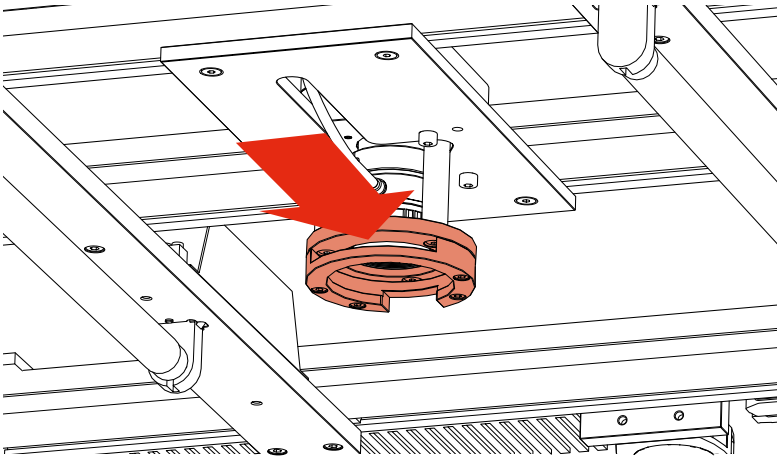
6

- Select one of the 6 lighting channels. The wavelengths are listed on-screen.
- Use the *Imaging Option* in the edit menu to adjust the camera settings if necessary.
- Click the *Select Colonies* → button to move on.



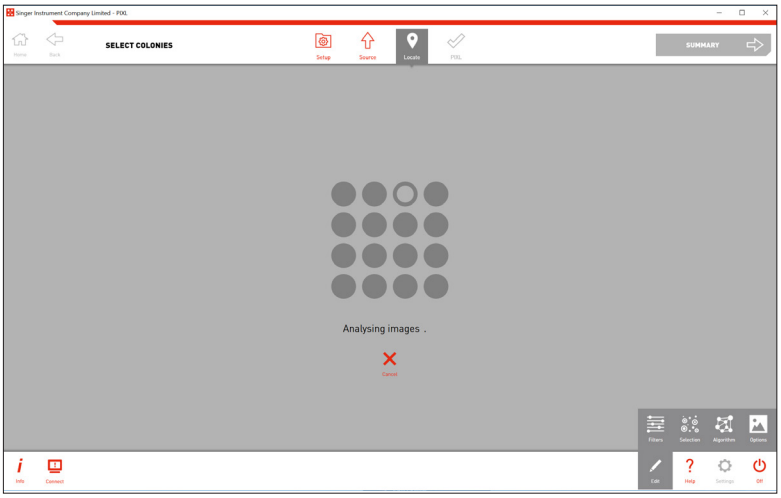
7

- If a camera filter is required, place it into the camera's *Filter Tray* before moving to the Select Colonies stage. Detailed instructions can be found on page 47.



8

- PIXL will now analyse the image to detect the colonies.



9

- You can see how many colonies are detected and, of those, how many are selected for picking.

- The edit menu has 4 options:
  Filters - Filter your picking selection by: proximity, intensity, colour, circularity and area.
  Selection - Choose how many colonies you want to pick from each sector and what parameters to choose them by.
  Algorithm - Select detection based on organism and image contrast.
  Options - Choose how to view your preview plate image.

- Manually deselect colonies by clicking on them.

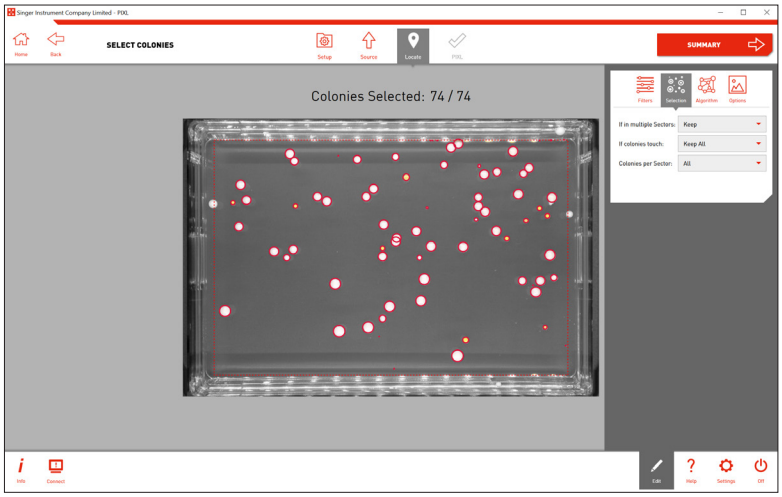
COLONY DETECTION OVERVIEW

10

- Use the *Filters Options* in the edit menu to select colonies within desired parameters.

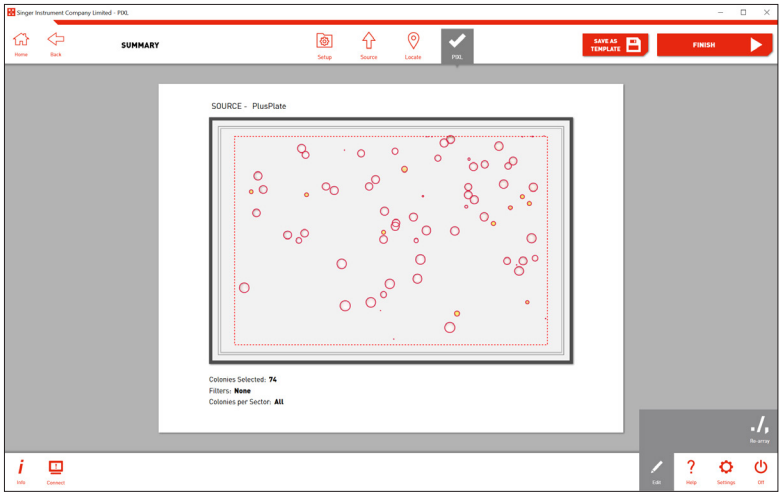
11

- Colony selection can be narrowed down even further by using the *Selection Options*.
- Click the *Summary* → button to move to the next stage.



12

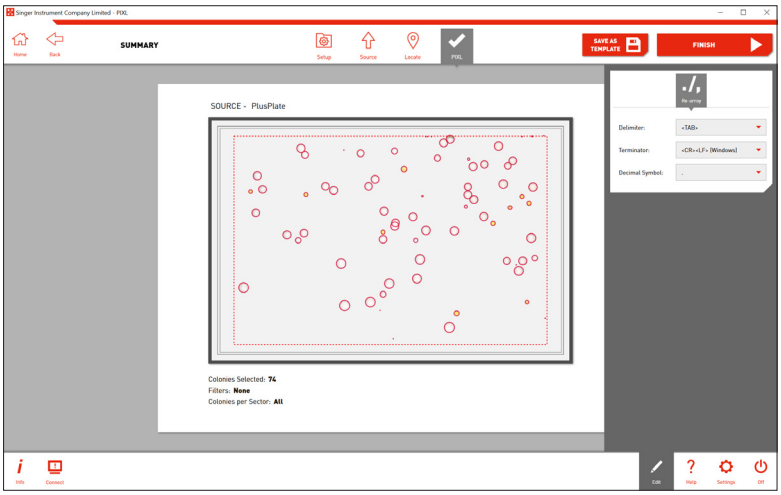
- Here you will see a summary of the colonies selected for location export.



13

- Use the *Re-array Options* in the edit menu to change the format of the export file. This file will be the base of your Re-array file. Further details on creating Re-array files can be found on page 56.

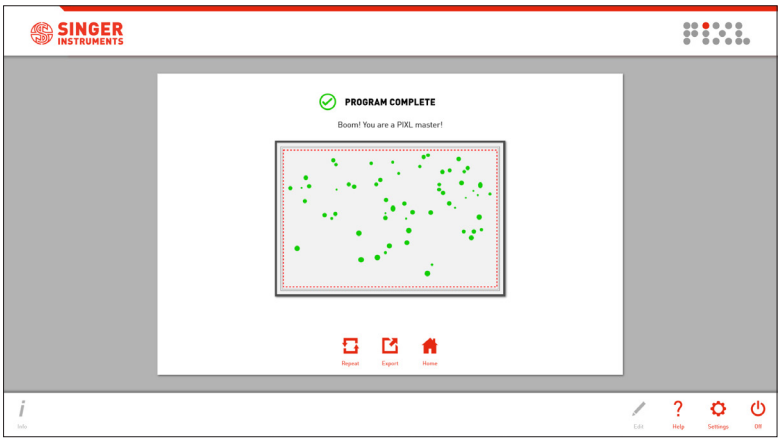
- Click the *Finish* → button to move to the next export stage.



14

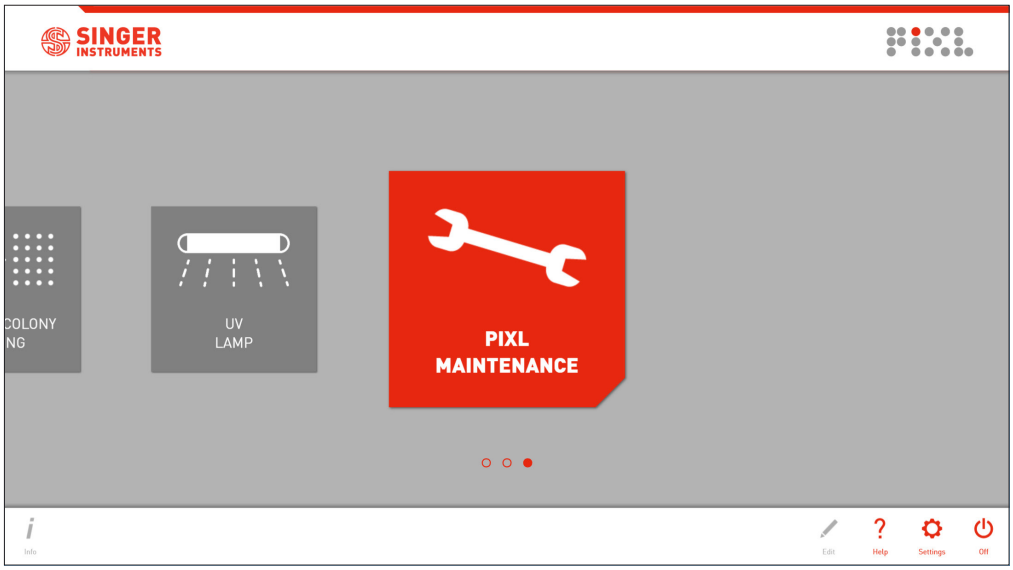
- Use the *Export* option to view all colony and routine information.

- This export will include a base Re-array template file, which lists the source colony locations. To turn this template into a working Re-array file, add the target plate information and pinning locations using the guide on page 56.



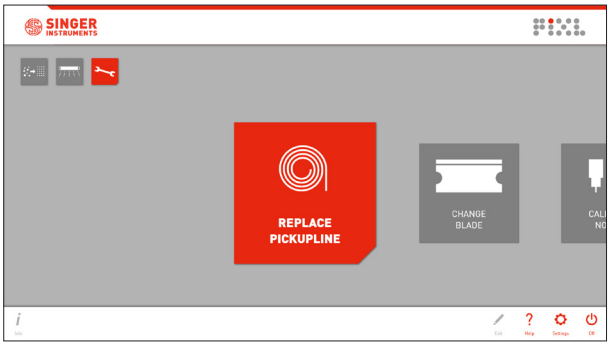
MAINTENANCE MENU

The PIXL software gives you detailed, animated instructions for all maintenance tasks, but this section also includes some step-by-step instructions as an offline reference.



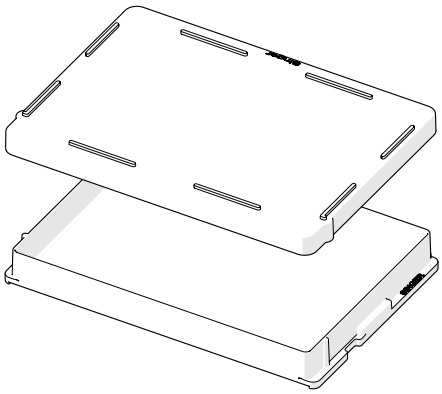
REPLACE PICKUPLINE™

1



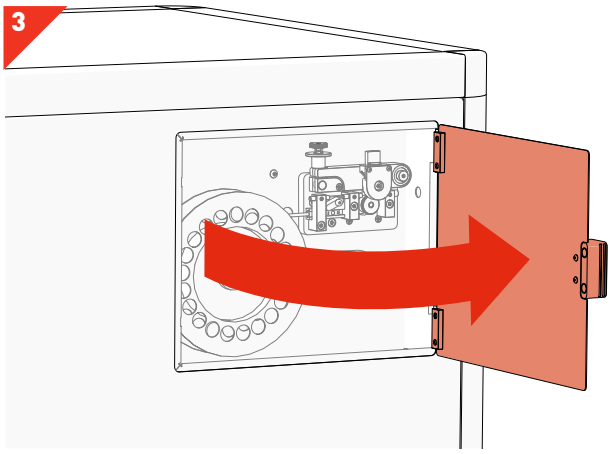
- In the Maintenance Menu, select the *Replace PickupLine* option and follow the on-screen instructions.

2



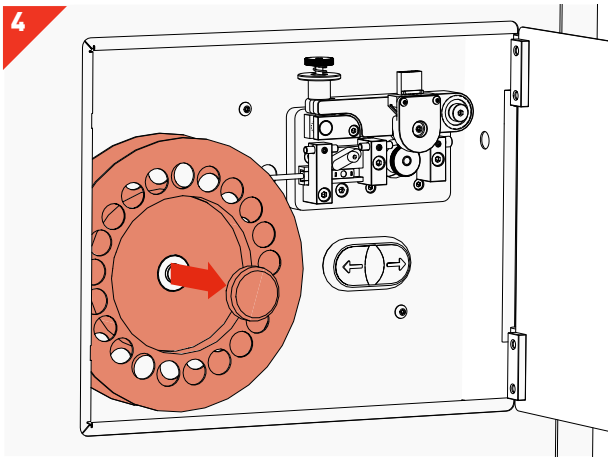
- If you're mid run, place lids on any plates in the PIXL.

3



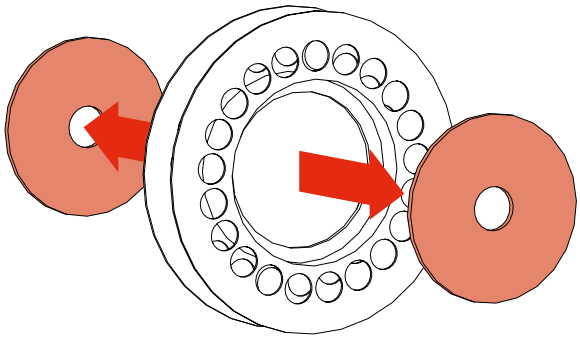
- Open the *PickupLine™ Compartment*.

4



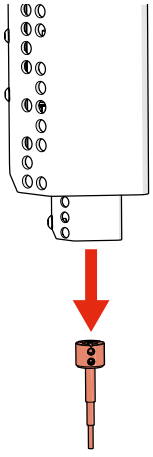
- Cut the remaining *PickupLine™* from the reel.
- Remove the magnetic *Reel Cap Cover*.
- Remove the empty *PickupLine™ Reel*.

5



- Remove the *Reel Backing Plates* from the empty reel.

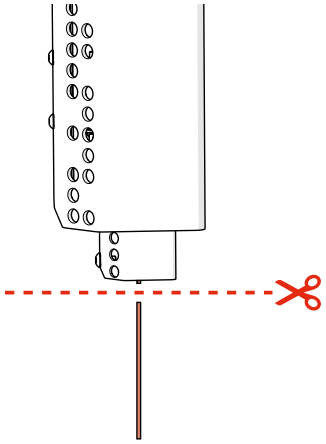
6



- In the main cabinet, gently remove the **Kinematic Nozzle**. The nozzle is connected magnetically, gently pull holding it by the black top.
- WARNING: May be hot.

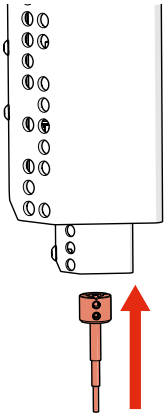
REPLACE PICKUPLINE™

7



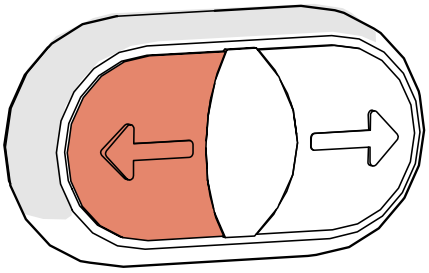
- Trim the remaining *PickupLine™* and dispose.
- WARNING: Failure to trim the end of the PickupLine™ may clog the machine.

8



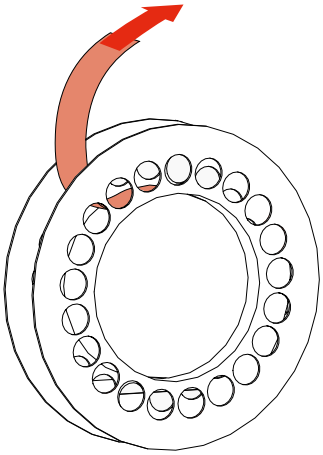
- Reattach the *Kinematic Nozzle* to the *PinPoint™ Picking Arm*.
- NOTE: Ensure the screw is facing forwards.

9



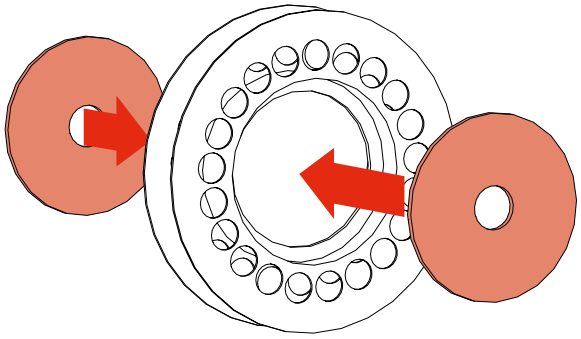
- Hold the *PickupLine™ Retract Button* to removed the leftover PickupLine™.

10



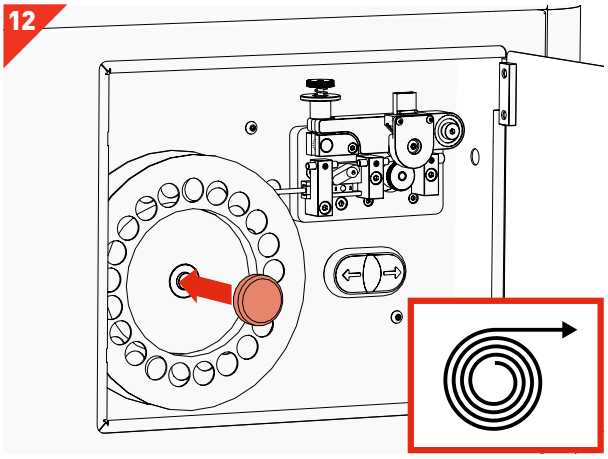
- Remove the new *PickupLine™ Reel* from it's sterile packet and dispose of the *Securing Tape*.

11



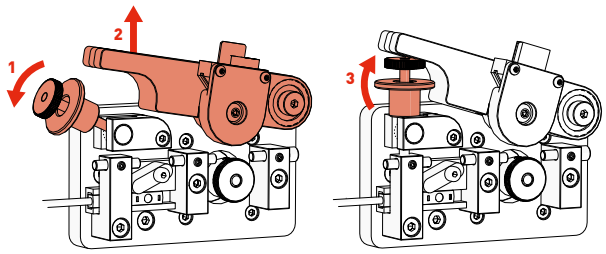
- Fit the *Reel Backing Plates* into new the *PickupLine™ Reel*.

12



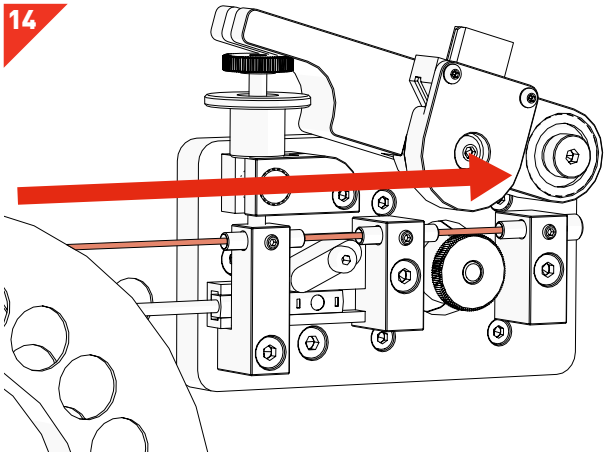
- Fit the new *PickupLine™ Reel* ensuring it feeds in a clockwise direction.
- Replace the *Reel Cap Cover*.

13



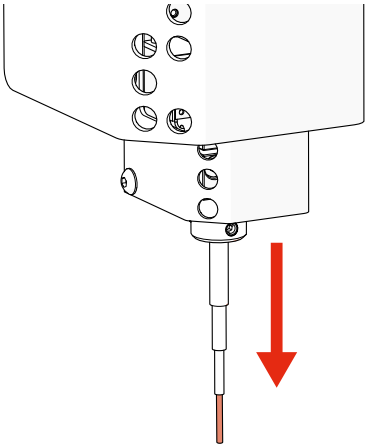
· Carefully lift the *Tension Lever* and rest it on the *Spring Catch* as shown.

14



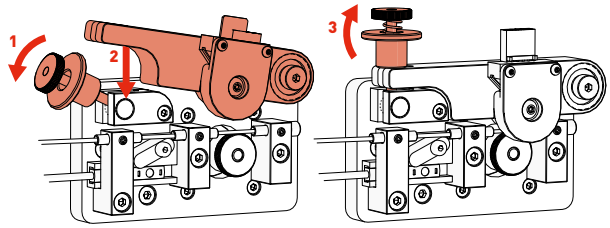
· Gently feed the *PickupLine™* by hand through the 3 *Entry Guides*. The PickupLine™ is sterilised at the nozzle but for extra sterility gloves should be worn.
· If you meet resistance, pull back slightly and re-feed.

15



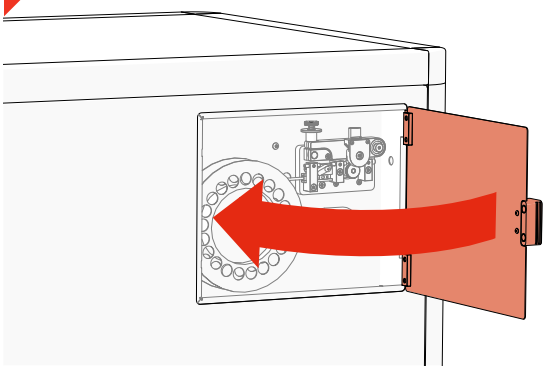
· Feed the *PickupLine™* until it protrudes 10mm from the *Kinematic Nozzle*.

16



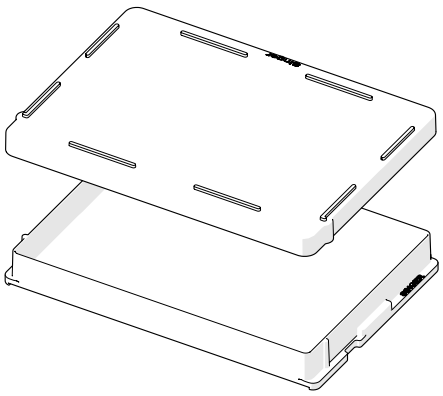
· Reset the *Tension Lever.*

17



· Close the *PickupLine™ Compartment*.

18



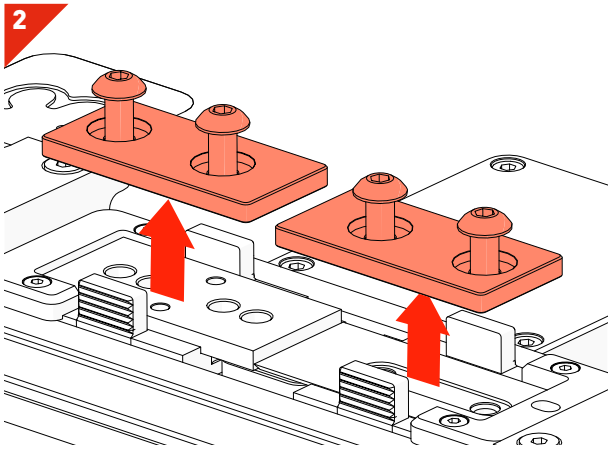
· Remove the *Plate Lids*.
· Click *Done*.
· The nozzle will now calibrate.

CHANGE BLADE

1

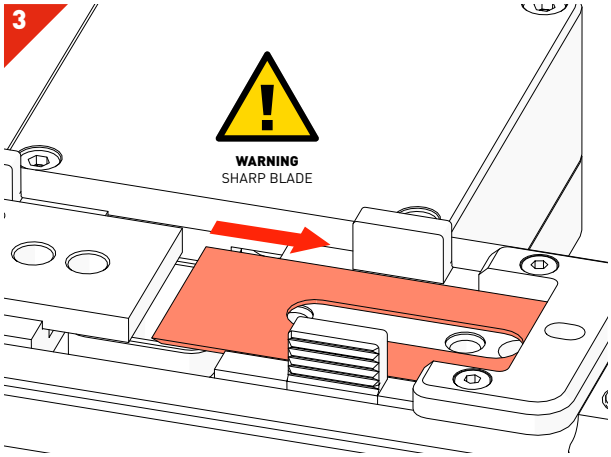
- On the maintenance menu, select *Change Blade*.
- Follow the on-screen instructions.

2



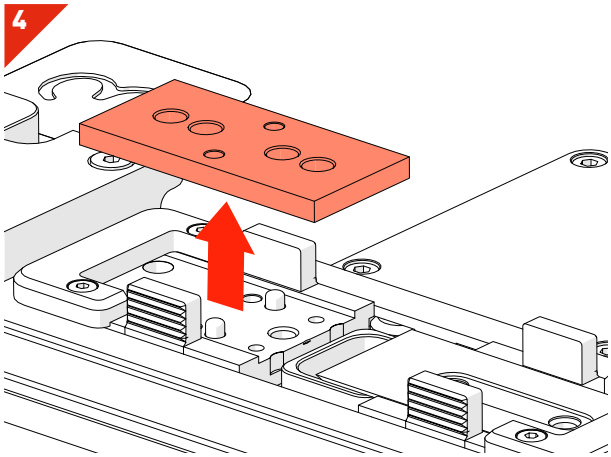
- Use a *2.5mm Hex Key* to remove the *Blade Clamp and Anvil Clamp*.
- Keep these safe — you'll need to reinstall these later.

3



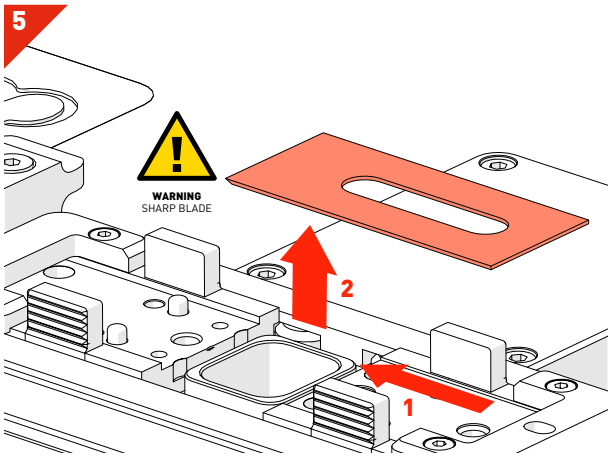
- Carefully slide the old *Blade* back away from the anvil.
- WARNING: Blade is sharp! Handle with care.

4



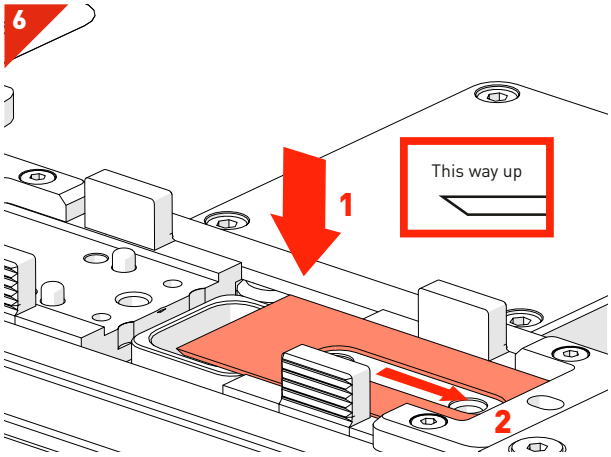
- Remove the old *Anvil* and discard.
- The anvil is securely attached with locator dowels.

5



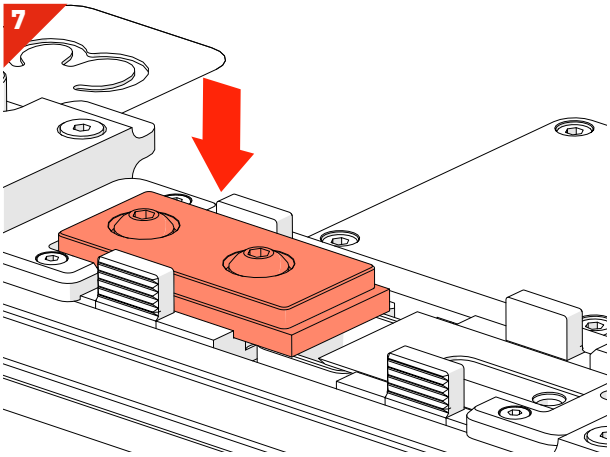
- Very carefully slide the *Blade* over the chute (1) and then remove (2).
- WARNING: Blade is sharp! Handle with care.

6



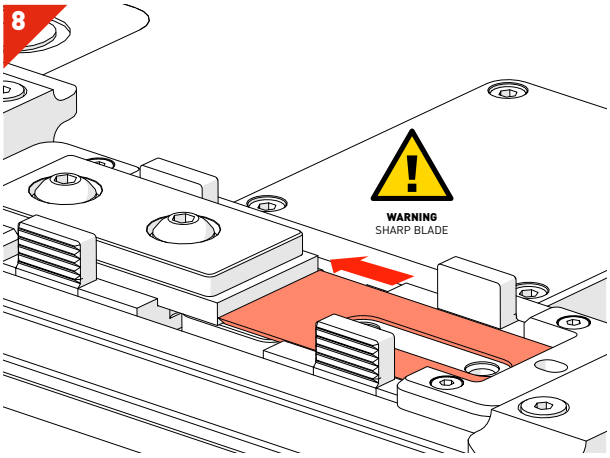
- Carefully fit the new *Blade* into the location grooves (1), ensuring it is the correct way up (as shown).
- Slide the *Blade* back away from the anvil side (2).
- WARNING: Blade is sharp! Handle with care.

7



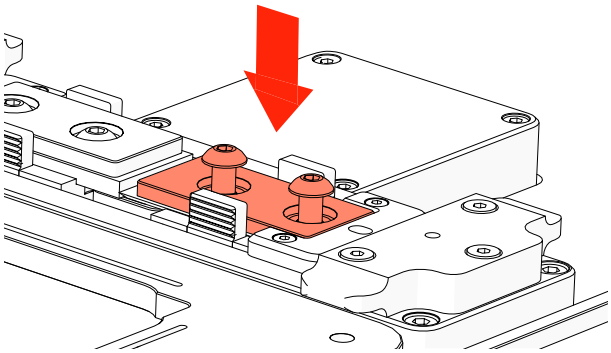
- Fit the new *Anvil*, securing it onto the locator dowels.
- Use the *2.5mm Hex Key* to secure the *Anvil Clamp*.

8



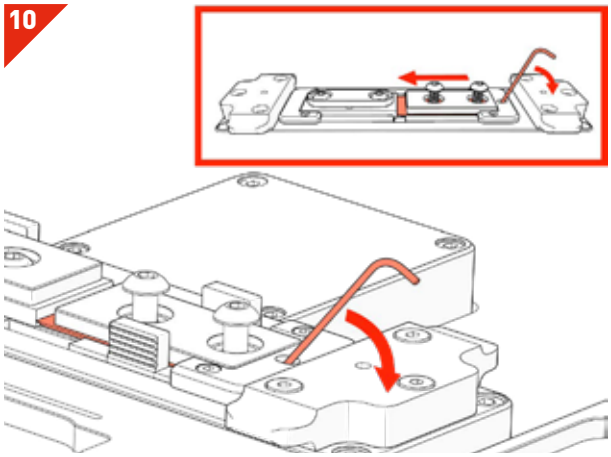
- Carefully slide the *Blade* forward to touch the *Anvil*.
- WARNING: Blade is sharp! Handle with care.

9



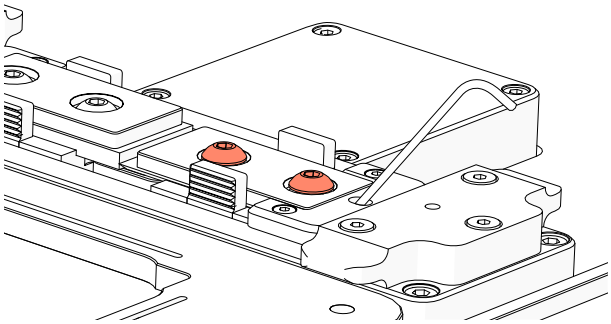
- Place the *Blade Clamp* over the blade.
- Using a *2.5mm Hex Key*, screw in the *Blade Screws* enough to hold the blade and clamp loosely in place.

10



- Use a *2.5mm Hex Key* to lever the *Blade* until it's touching the anvil as shown.
- WARNING: Blade is sharp! Handle with care.

11



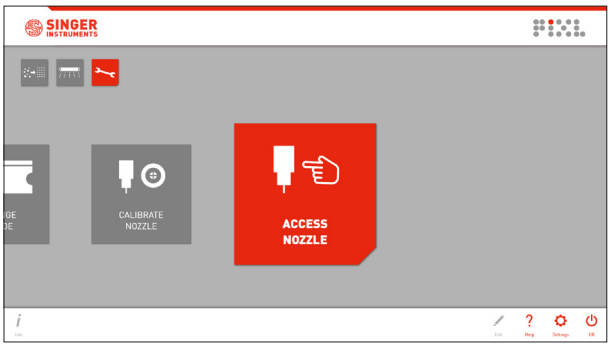
- Keep the *2.5mm Hex Key* in place while tightening the *Blade Screws* using the other *2.5mm Hex Key*.
- Make sure the blade is still touching the anvil.
- WARNING: Blade is sharp! Handle with care.

12

- Click *Done* to return to the maintenance menu.

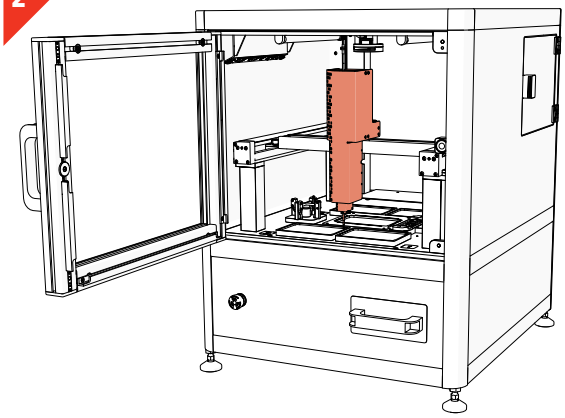
REPLACE NOZZLE

1



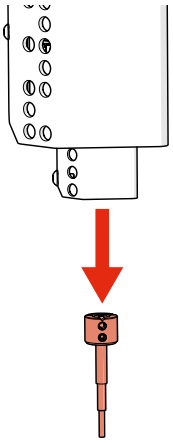
· On the maintenance menu, select *Access Nozzle*.

2



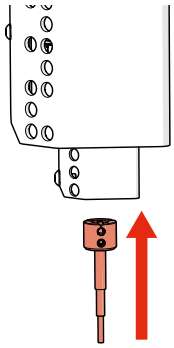
· The nozzle will move to the front of the machine to allow access.

3



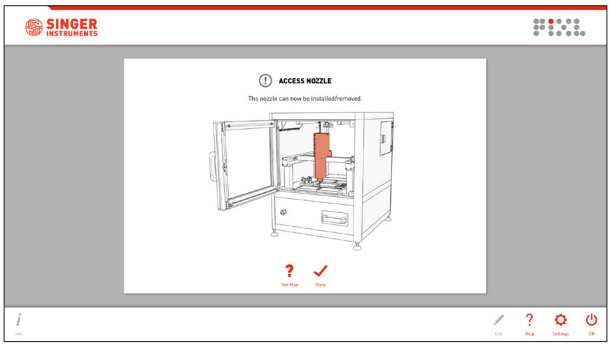
· Gently pull the *Kinematic Nozzle* from it's securing magnet. The nozzle is autoclavable.
· WARNING: The nozzle may be hot!

4



· Attach the new/autoclaved *Kinematic Nozzle* back onto the securing magnetic, being sure to feed any PickupLine™ through the nozzle in the process.
· Ensure the screws are at the front of the nozzle.

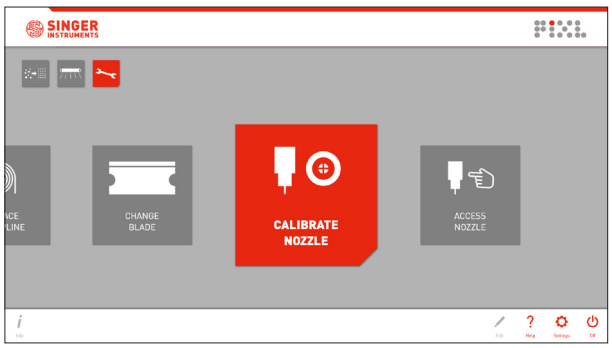
5



· Click *Done* and the nozzle will calibrate.

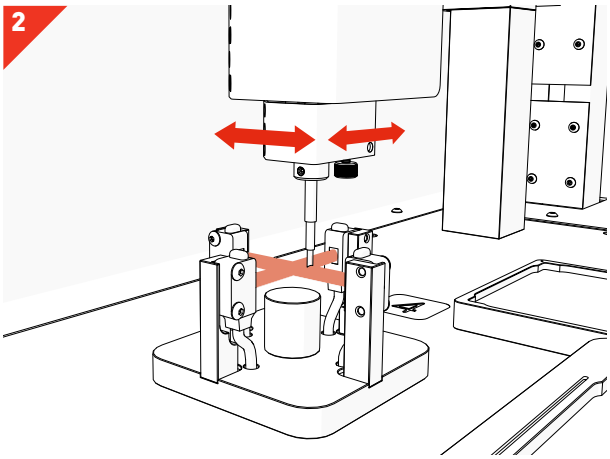
CALIBRATE NOZZLE / CAMERA

1



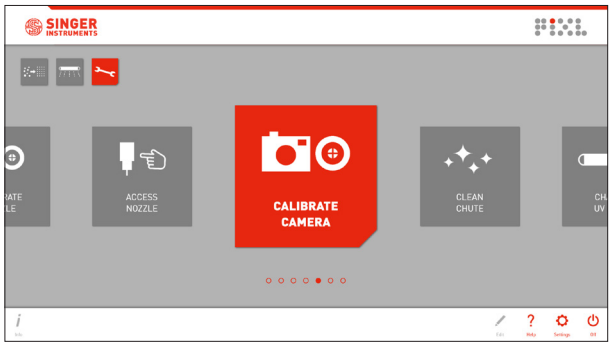
- To ensure picking accuracy, the nozzle needs to be calibrated any time it has been removed.
- On the maintenance menu, select *Calibrate Nozzle*.

2



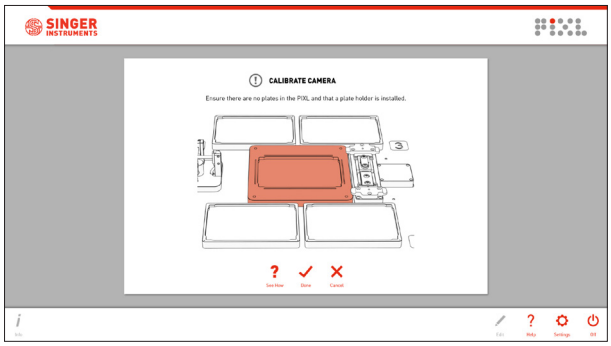
- Follow the on-screen instructions as the nozzle calibrates on the calibration plate.
- Once complete, you will be returned to the *Maintenance Menu*.

1



- On the maintenance menu, select *Calibrate Camera*.

2



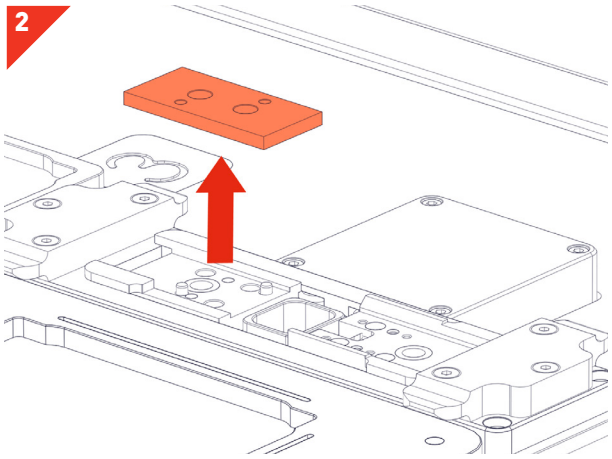
- Ensure you have removed any plates from the PIXL, and make sure there is a source plate bay loaded.
- Click *Done* and the camera will calibrate.
- Once complete, you will be returned to the *Maintenance Menu*.

CLEAN WASTE CHUTE

1

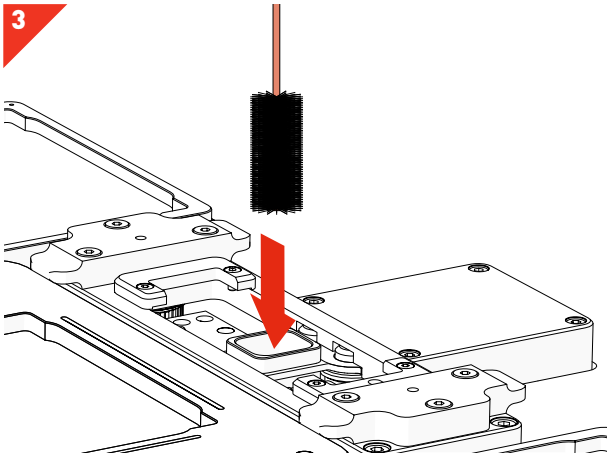
· On the maintenance menu, select *Clean Chute*.

2



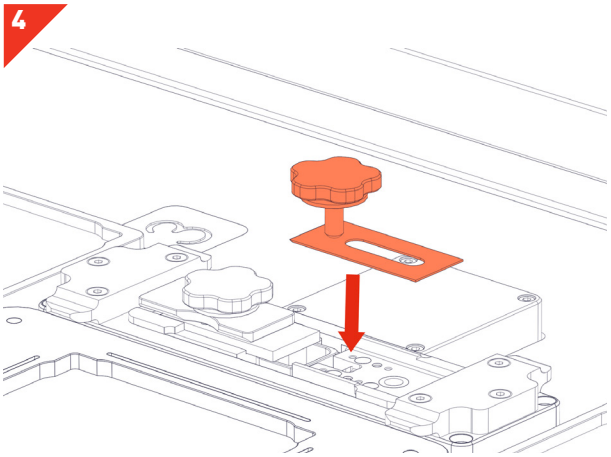
· Remove the blade and anvil as shown on page 39, steps 2-6.

3



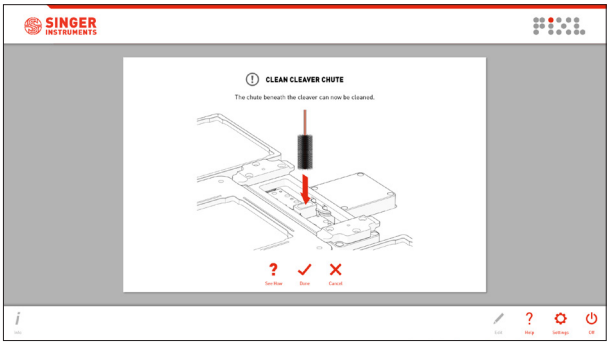
· The waste chute comes into contacted with used PickupLine™. Use a bottle cleaner and ethanol to clean the inside of the chute.

4



· Reinstall the blade and anvil as shown on page 40, steps 7-12.

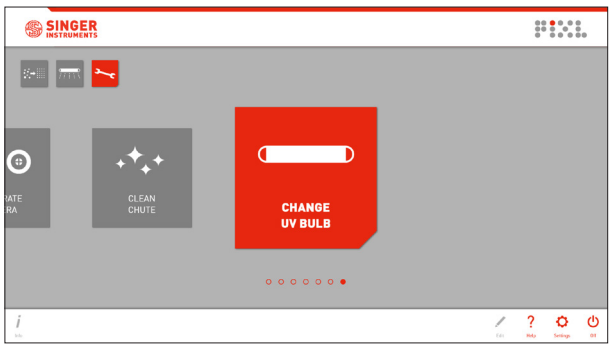
5



· Click *Done* to return to the maintenance menu.

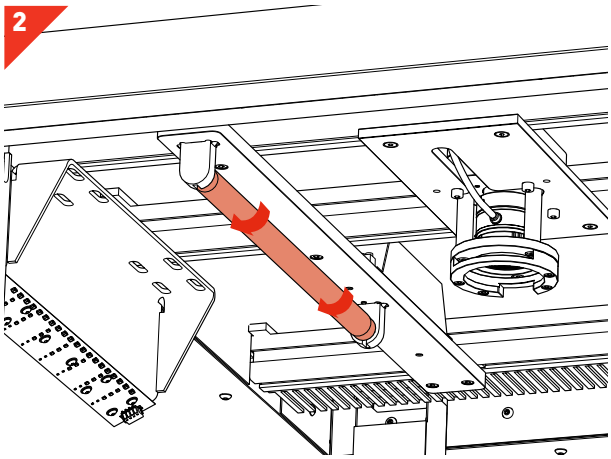
CHANGE UV BULB

1



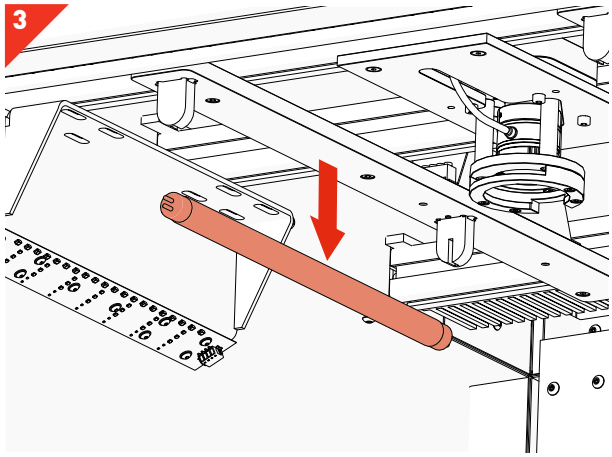
· On the maintenance menu, select *Change UV Bulb*.

2



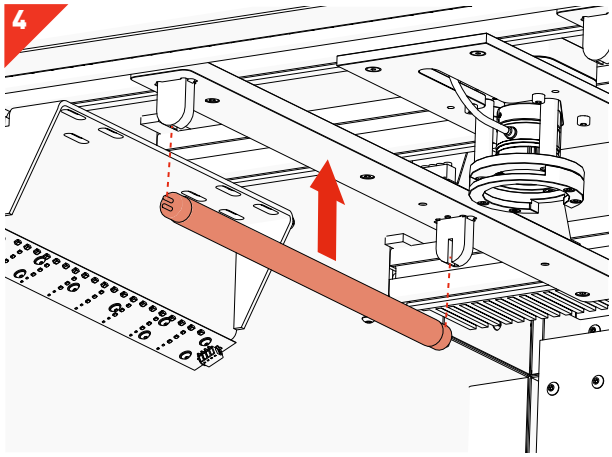
· Rotate the *UV Bulb* that you want to change 90 degrees, in either direction, until you hear a click.
· NOTE: Wear gloves.

3



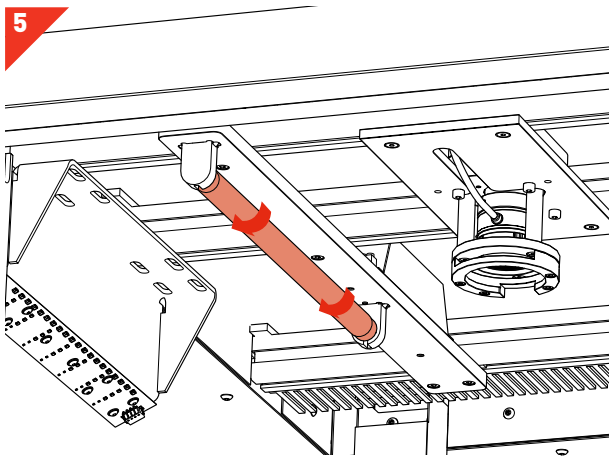
· Carefully pull the old *UV Bulb* down and remove.

4



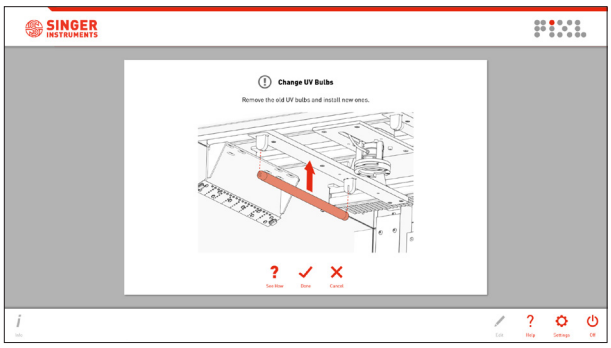
· Slot the new *UV Bulb* into the *UV Socket Grooves*.

5



· Rotate the new *UV Bulb* 90 degrees, in either direction, until you hear a click.

6



· Click *Done* to return to the maintenance menu.

BEST PRACTICE

We want you to have a trouble-free time with your PIXL so we've assembled some handy hints, tips and troubleshooting answers to keep you on the straight and narrow.

SOURCE PLATES

The PIXL accepts the following source plate formats:

- 90 mm Petri Dishes
- 150 mm Petri Dishes
- 120 mm Square Petri Dishes
- Rectangular PlusPlates™

TARGET PLATES

The PIXL accepts the following target plate formats:

- 96 Multiwell
- 384 Multiwell
- 96 Deep Well
- 384 Deep Well
- 96 Well PCR
- 384 Well PCR
- Rectangular PlusPlates™

LOADING PLATES

When loading your source plate, ensure that you have the correct source bay installed.

Source bays fit magnetically, simply lift the current source bay out and replace it with the correct source bay for your plate type, as shown in *Figure 1*.

Each target bay is colour-coded and numbered. The software will show you which bays to load your plates into. A1 is in the top left corner of each bay, *Figure 2*.

NOTE: Remove lids before loading plates into PIXL.

PLATE DIMENSIONS

All source and target plate types have default dimensions in the PIXL software. You can view these when on the *Source and Target Stages*, in the *Edit Menu*, under the *Dimensions Tab*, as shown in *Figure 3*.

If the plates you plan to use are drastically different from the default dimensions, please contact technical support and we'll add your specific plate type to the drop down list:
technicalsupport@singerinstruments.com

Figure 1

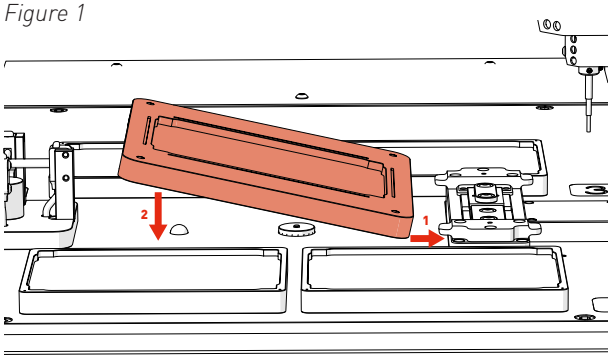


Figure 2

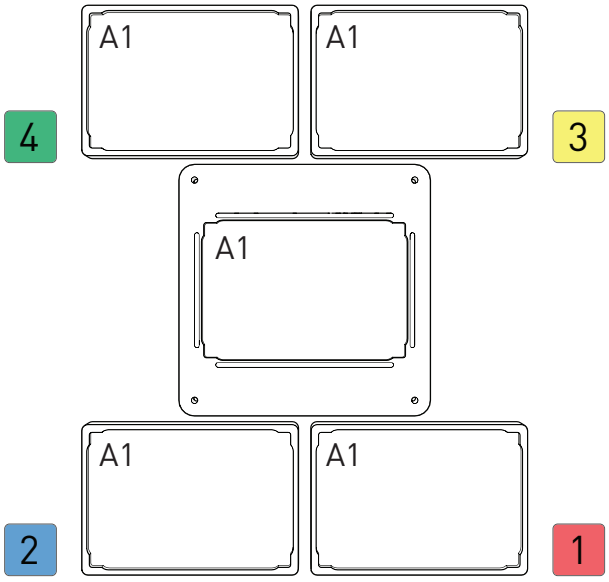
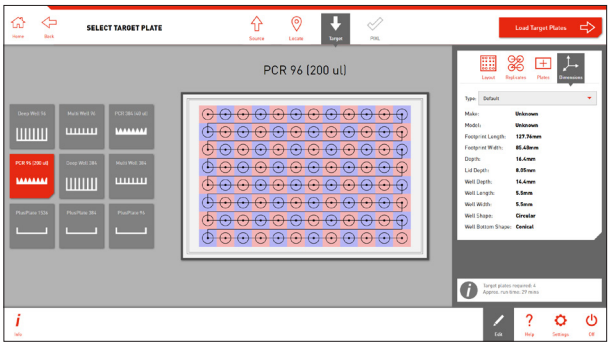


Figure 3



USING FILTERS

PIXL accepts standard 50mm filters. You can easily switch between all of your favourite lighting conditions to filter for the markers that interest you.

Insert your filters at the locate stage while you have the live preview image on screen, *Figure 4*.

The filters are manually inserted in front of the CMOS camera, into the *Filter Tray*, as shown in *Figure 5*.

USING THE BLACKOUT SCREEN

Natural light passing through the PIXL door can interfere with some florescence imaging, when using certain LED wavelengths. In those circumstances the blackout screen can be inserted to prevent light interference.

To install the blackout screen, simply slide it into the grooves on the inside of the main door. Make sure the handle slot aligns with the door handle, as shown in *Figure 6*.

Remember to remove the screen when you load the target plates to be able to see the pinning routine in action.

Figure 4

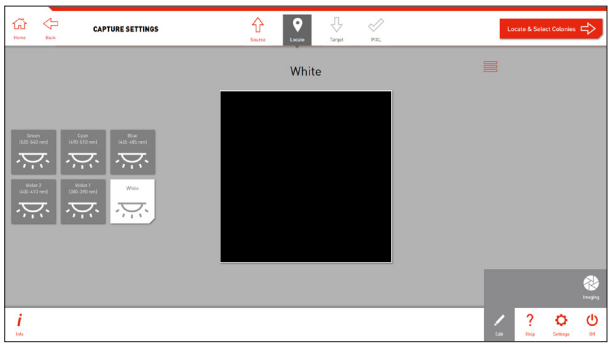


Figure 5

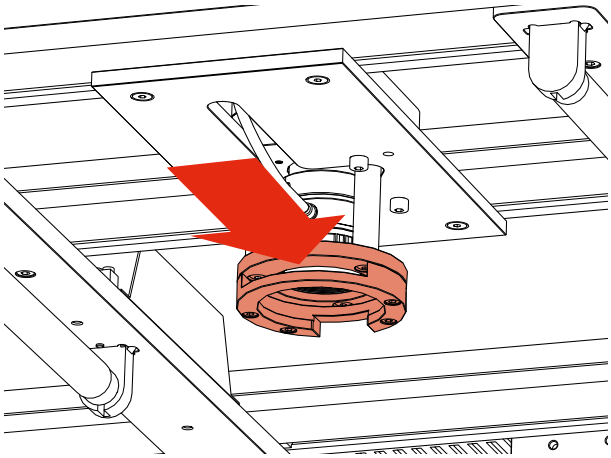
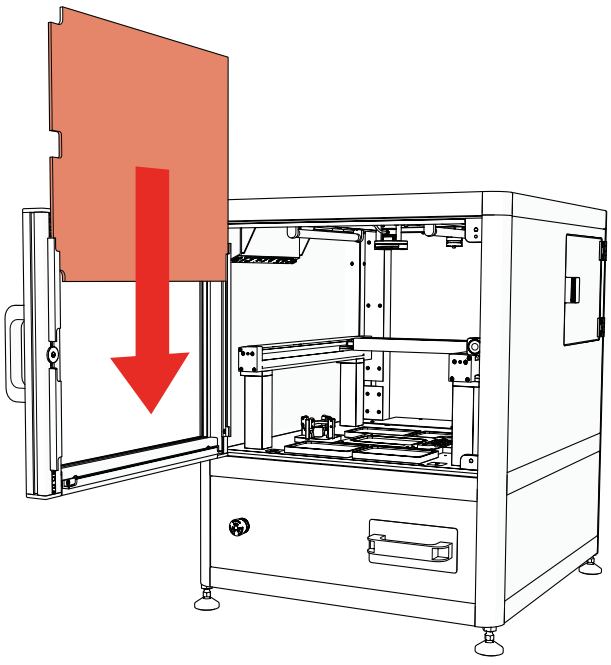


Figure 6



WASTE CHUTE

The waste chute comes into contact with used PickupLine™. Use a bottle cleaner, with ethanol or an appropriate cleaning agent, to clean the chute, as shown in *Figure 7*.

To gain access to the waste chute, you will need to remove the cleaver assembly. For full instructions see page 43.

DUMP DRAWER

The dump drawer collects all of the used tips at the bottom of the waste chute *Figure 8*.

The dump drawer can also be autoclaved.

KINEMATIC NOZZLE

To help ensure sterility, the kinematic nozzle is autoclavable. Spare nozzles are also available to reduce downtime during autoclaving.

UV

The UV lamp program is located on the home screen *Figure 9*. The UV lamp can be set to run for up to 60 minutes to sterilise the main cabinet *Figure 10*. For complete sterility, we recommend each day giving the inside of the machine a wipe down with ethanol and running a small UV routine.

Figure 7

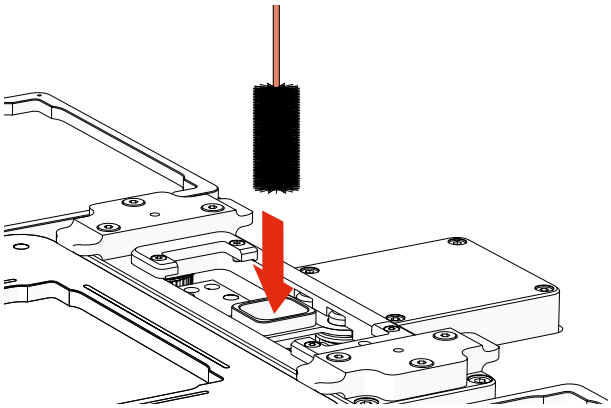


Figure 8

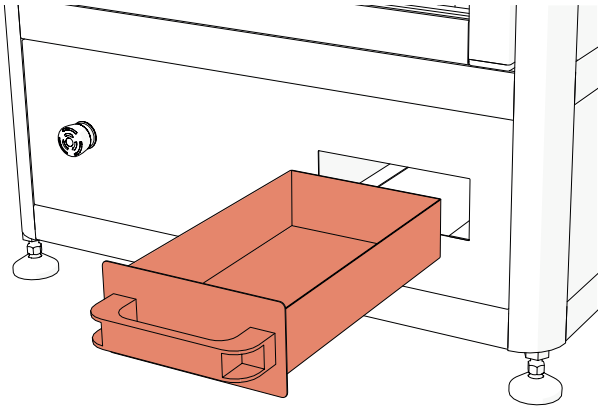
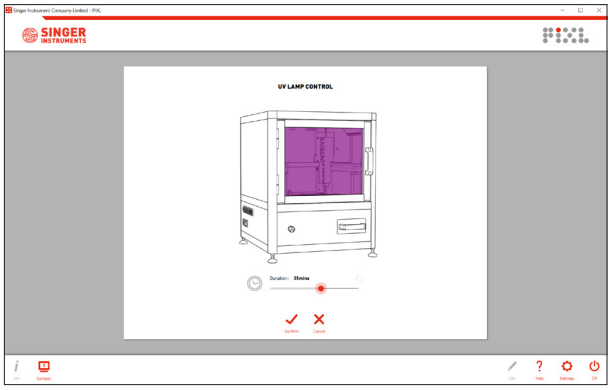


Figure 9

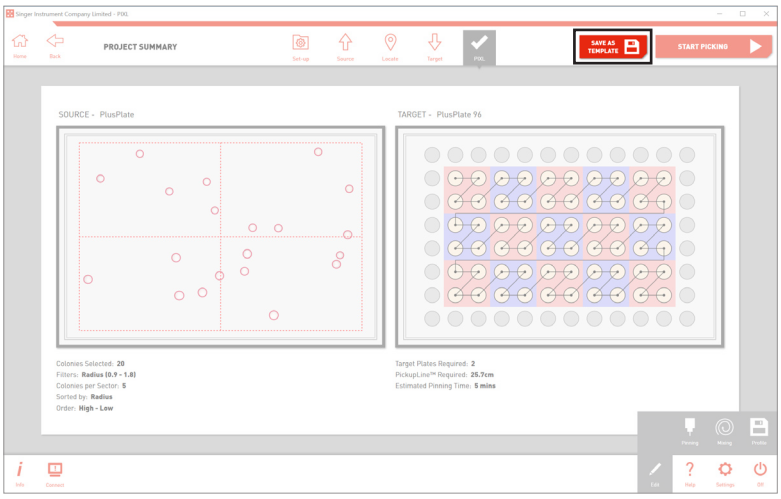
Figure 10



PROJECT TEMPLATES

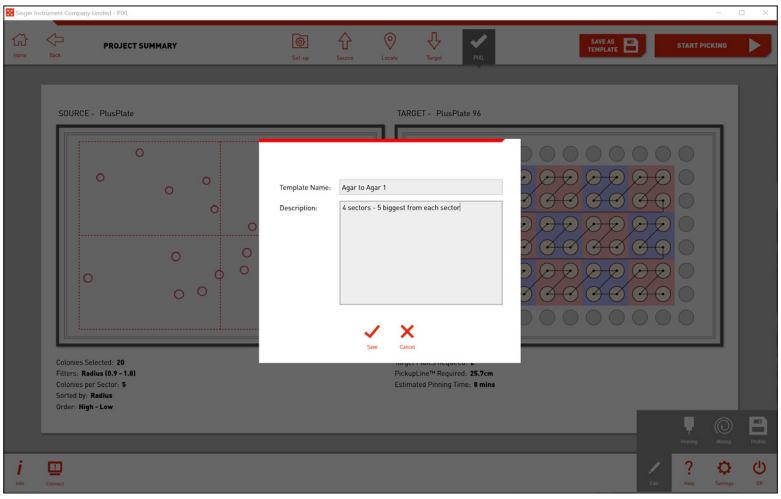
1

- You can save projects as templates at the *Project Summary* stage by clicking he *Save as Template* button.



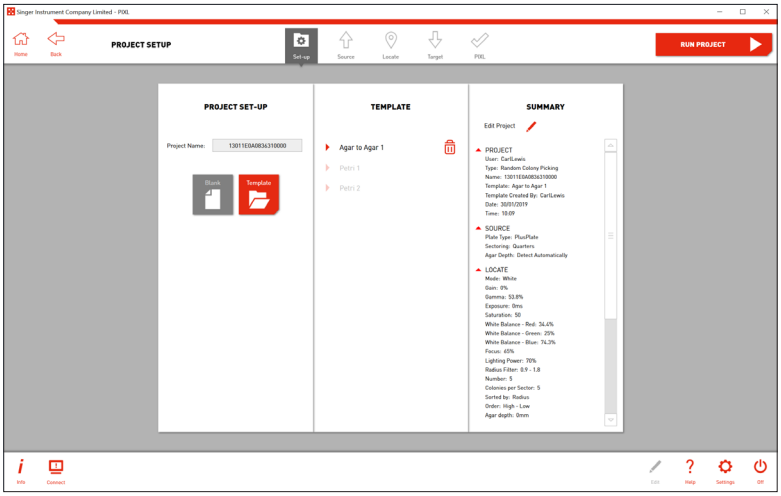
2

- Name your template and add a quick description then click *Save*.



3

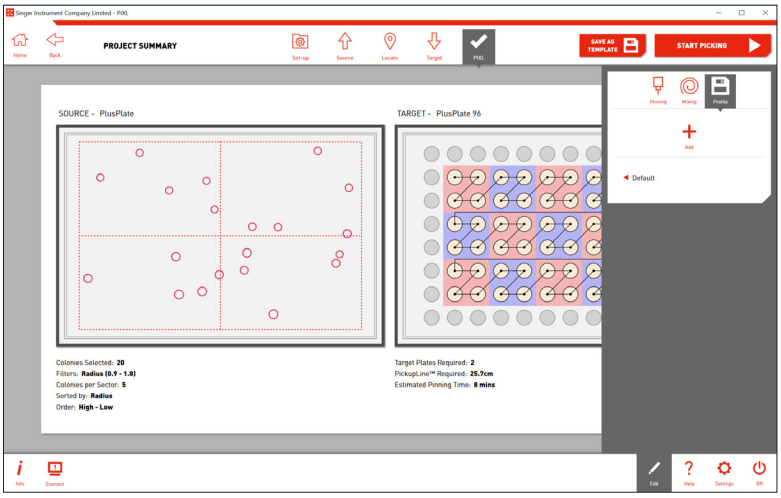
- At the *Project Setup* stage you can see all project templates.
- When you select a template, clicking *Run Project* → will take you to the plate loading stages then a project summary.
- Clicking *Edit Project* will allow you to step through a workflow using the template as a base.



PINNING AND MIXING PROFILES

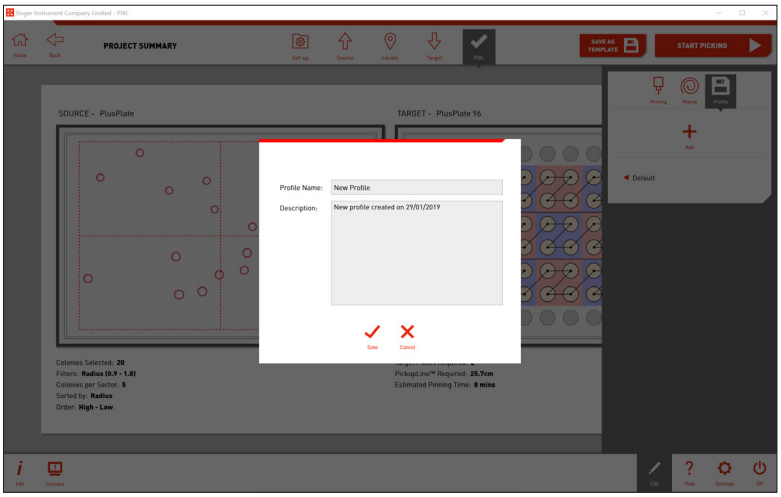
1

- You can save your pinning and mixing settings as a profile to be recalled for any future projects using the *Profile Options* in the edit menu.
- Click *Add* to save your current pinning and mixing settings.



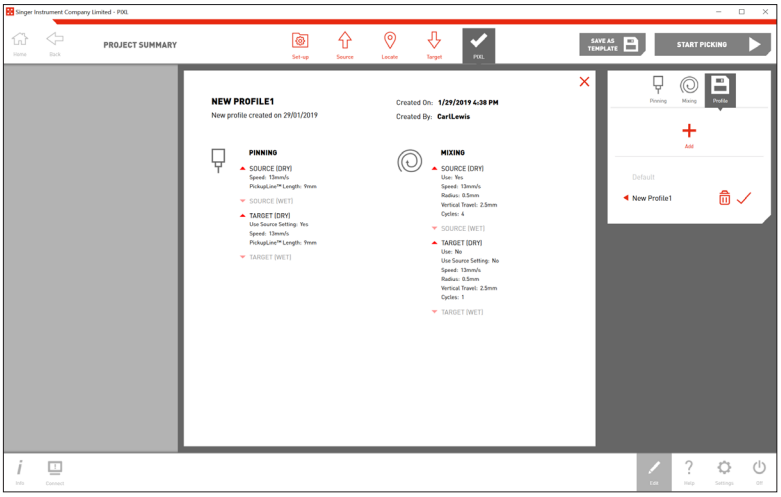
2

- Name your profile and add a quick description then click *Save*.



3

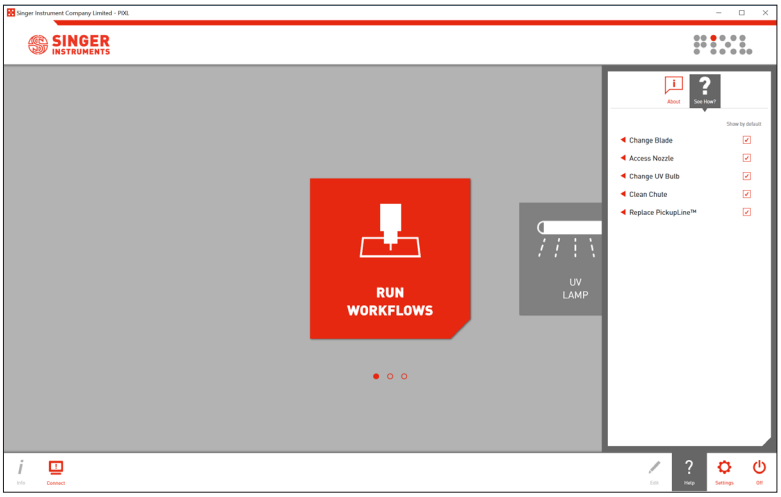
- Click on any of the saved profiles to see a summary of the pinning and mixing options.
- Click the tick icon to select that profile for your current project.



HELP - SEE HOW VIDEOS

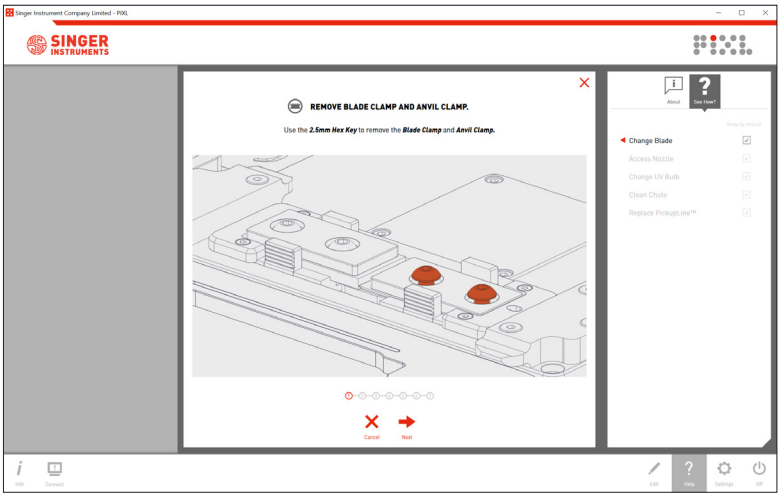
1

- When you select an action in the maintenance menu you are guided though the process with step by step animations.
- You can access these videos at any time in the *Help Menu*.

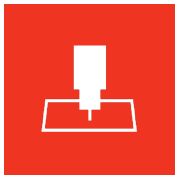


2

- Click on an item from the list to see the step by step instructions.



HOME SCREEN

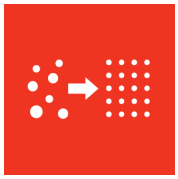


RUN WORKFLOWS
Takes you to the PIXL Workflows Menu.

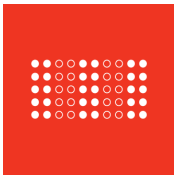
UV LAMP
Allows you to run the UV lamp for a specified period of time.

PIXL MAINTENANCE
Takes you to the PIXL Maintenance Menu.

WORKFLOWS MENU



RANDOM COLONY PICKING
Starts a new Random Colony Picking routine.



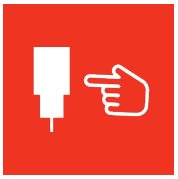
RE-ARRAY
Starts a new Re-array routine.

MAINTENANCE MENU

REPLACE PICKUPLINE™
Allows you to change the PickupLine™ reel. On-screen instructions are provided.

CHANGE BLADE
Allows you to change the cleaver blade and anvil. On-screen instructions are provided.

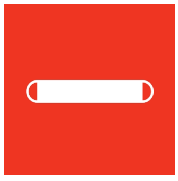
CALIBRATE NOZZLE
Automatically calibrates the kinematic nozzle to ensure picking accuracy.



ACCESS NOZZLE
Brings the kinematic nozzle to the front of the machine. From here you can remove for autoclaving.

CALIBRATE CAMERA
Automatically calibrates the camera to ensure colonies are located accurately.

CLEAN CHUTE
Allows you to remove the cleaver assembly to give access to the waste chute for cleaning.



CHANGE UV BULB
Allows you to change the UV bulbs. On-screen instructions are provided.

BOTTOM BAR (COMMANDS)

PROJECT INFO
Shows a full project summary so far.

HELP MENU
Opens the PIXL help menu.

OFF
Switch users, exit software, reset PIXL, or shutdown PIXL.

EDIT MENU
Edit stage-specific project options.

SOFTWARE SETTINGS
Run the UV lamp for a specified period of time.

TOP BAR (NAVIGATION)

HOME
Takes you back to the home screen.

BACK
Takes you back to the previous stage.

PROJECT SETUP
Takes you back to the project setup stage. Icon is grey when disabled.

SOURCE
Takes you back to the source stage. Icon is grey when disabled.

LOCATE
Takes you back to the locate stage. Icon is grey when disabled.

TARGET
Takes you back to the target stage. Icon is grey when disabled.

PIXL
This is the summary stage — the last stage before the pinning routine starts.

NEXT STAGE
Takes you on to the next stage.

EDIT MENU

SECTORS
Found on the source stage. Split your source plate into sectors.

DIMENSIONS
Found on the source and target stage. Shows the default dimensions of each plate type.

RENAME
Found on the plate loading stages. Scan barcodes or rename plates manually.

IMAGING
Found on the locate stage. Allows you to edit the camera settings.

FILTERS
Found on the locate stage. Filter your selected colonies by proximity, colour, intensity, circularity, and area.

ALGORITHM
Found on the locate stage. Optimise the colony detection for specific organisms.

LAYOUT
Found on the target stage. Exclude rows and columns on your target plates.

ADDITIONAL PLATES
Found on the target stage. Select how many copies of each target plate to make.

MIXING
Found on the PIXL stage. Turn on and adjust the mixing options such as speed or number of cycles.

SELECTION
Found on the locate stage. Further refine your colony selection for picking.

PICTURE OPTIONS
Found on the locate stage. Choose how to display the source plate.

REPLICATES
Found on the target stage. Select how many copies of each colony to pin.

PINNING
Found on the PIXL stage. Adjust the pinning options such as speed or well clearance.

PROFILE
Found on the PIXL stage. Save pinning and mixing options as a profile.

SELECTION LAYOUT OPTIONS

SORT ALPHABETICALLY
Sort options alphabetically.

SORT BY POPULARITY
Sort options by most popular options first.

CAROUSEL LAYOUT
Display options in a carousel.

EXPAND SLIDER
Expand slider to a full screen view.

SORT BY LAST USED
Sort options by last used first.

GRID LAYOUT
Display options in a grid

RESET SLIDER
Reset slider to the default value.

PROBLEM	SOLUTION
Plate guides could not be detected	Ensure that a source plate holder is installed into the PIXL.
The PickupLine™ hits the top plate as the picking arm moves between positions	Ensure that the plate dimensions in the software match that of the plate being used. If the plate type is unsupported please contact technicalsupport@singerinstruments.com and we'll make a new dimensions file for the plate.
The PIXL is missing colonies.	Ensure that the nozzle has been calibrated by running the 'Calibrate Nozzle' routine in the software. Ensure that the Detect automatically' option is selected for 'Agar Depth'.
Blades wear quickly.	Please correctly follow instructions for changing the blade on page 39.

INTRODUCTION

So, you're looking to get stuck into re-arraying - awesome. If you're unsure, re-arraying for this purpose, is picking colonies from user defined locations and placing them at user defined positions. This is completely customisable, and can use several plate types and either exact coordinates, or traditional well locations.

What this really means is, you can pick from anywhere to anywhere, in almost any plate type - how cool!

So, what do we need to get started?

- A program that can export .tsv (or .csv) files; Excel and Google Sheets both work.
- Which plates you want to pick from, and to.
- An idea of where we're pinning from, and to.

Got all this? Awesome.

CREATING YOUR FILES

Using a program like Excel, or Google Sheets, we firstly need to define the plates to pick from and to. This should be similar to the example below:

Plate_Name	Plate_Type	Density	Role
SourcePlate1	MWP	96	Source
TargetPlate1	SBS	96	Target

NOTE: A re-array template is exported for all Random Colony Picking Projects.

PLATE NAMES

This is an arbitrary name that you can give to each plate, or by placing a '$' prior to the name the plate will be given a unique ID. This name is only used within the exported data logs, so you can use anything.

For simplicity, consider using '$SourcePlate1' and '$TargetPlate1' for ease of file creation, and PIXL will assign unique names for the export logs.

PIXL will decide which plates should go where, typically the 'Source' plate will go to the source bay, and the first target plate will go into bay 1. This is necessary as some plates are required to be in specific bays, and user defined plate locations will limit the flexibility of re-arraying. PIXL will produce instructions on where to load plates, based on the Plate Name.
Note: if you're using '$TargetPlate1' or similar, the plate names will already be automatically generated and will not match the original input.

PLATE TYPES

There are a few options for plate types, you must state which type each plate is at the start of the file. Choose from the following:

- SBS - SBS plate filled with agar
- MWP - Multi well plate
- DWP - Deep well plate
- PCR - PCR plate
- P90 - 90mm petri dish
- P150 - 150mm petri dish

In the example above, we're picking from a Multi Well Plate (MWP) to an SBS agar plate.

PLATE DENSITY

Now we need to define the density of our plates, you can choose from the following options:

- 96
- 384
- 1536
- None - This is only used for coordinate picking, and must be the density for any petri dish.

PLATE ROLE
Lastly, we need to define the role of each plate, in the example above, we have 'SourcePlate1' set to 'Source', and 'TargetPlate1' set to 'Target'.

PLATE DIMENSIONS (OPTIONAL)
You can specify dimensions after the plate role, however this is not needed - PIXL will run based off the standard stored dimensions for each plate type. If you need to add custom dimensions you should contact us for further help.

Now we've completely defined our plates, all that's left is the pinning locations, these can be defined in two ways:

1. Using grid (well) references, e.g. A1, B3, H7 etc.

It's important to highlight that the locations are Y,X as is normal on a 96 well plate, and not a standard graph.

You can use either letters or numbers, PIXL will recognise either. Personally, I prefer to use letters as you'd find on a standard MWP. Check out the two tables below to understand this further:

Plate Locations for a 96 MWP

	1	2	3	4	5	6	7	8	9	10	11	12
A	A,1	A,2	A,3	A,4	A,5	A,6	A,7	A,8	A,9	A,10	A,11	A,12
B	B,1	B,2	B,3	B,4	B,5	B,6	B,7	B,8	B,9	B,10	B,11	B,12
C	C,1	C,2	C,3	C,4	C,5	C,6	C,7	C,8	C,9	C,10	C,11	C,12
D	D,1	D,2	D,3	D,4	D,5	D,6	D,7	D,8	D,9	D,10	D,11	D,12
E	E,1	E,2	E,3	E,4	E,5	E,6	E,7	E,8	E,9	E,10	E,11	E,12
F	F,1	F,2	F,3	F,4	F,5	F,6	F,7	F,8	F,9	F,10	F,11	F,12
G	G,1	G,2	G,3	G,4	G,5	G,6	G,7	G,8	G,9	G,10	G,11	G,12
H	H,1	H,2	H,3	H,4	H,5	H,6	H,7	H,8	H,9	H,10	H,11	H,12

Or using numbers only

	1	2	3	4	5	6	7	8	9	10	11	12
1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10	1,11	1,12
2	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10	2,11	2,12
3	3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10	3,11	3,12
4	4,1	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	4,10	4,11	4,12
5	5,1	5,2	5,3	5,4	5,5	5,6	5,7	5,8	5,9	5,10	5,11	5,12
6	6,1	6,2	6,3	6,4	6,5	6,6	6,7	6,8	6,9	6,10	6,11	6,12
7	7,1	7,2	7,3	7,4	7,5	7,6	7,7	7,8	7,9	7,10	7,11	7,12
8	8,1	8,2	8,3	8,4	8,5	8,6	8,7	8,8	8,9	8,10	8,11	8,12

The following work through and examples all use the alpha numeric layout rather than the numeric only layout. They are interchangeable and either can be used.

2. Using exact coordinates, e.g. -34.0,22.5 etc.

This is more a more complex, but precise method of telling PIXL exactly where to pick. You'll need to generate coordinates for your colonies, which you can get from PIXL outputs, or potentially other plate analysis software.

It's really important to highlight that PIXL uses cardinal coordinates; where the center of the plate is '0.0,0.0'. Check out the overview of an SBS format plate below to understand this further:

	-59.0						0.0						59.0
-41.5													
		A1										A12	
0.0							0.0,0.0						
		H1										H12	
41.5													

This plate contains the outer limits of an SBS format plate, with approximate locations of the four corner wells found on a 96 MWP. A density of 'None' is also required if using a Petri dish, which will require coordinate locations for all picks.

When using coordinates, you must have the plate density set to 'None' and in each coordinate you must use a decimal point; '0.0,0.0' is valid, however '0,0' is not and PIXL will interpret this as a plate location from the 96 MWP maps above - this will lead to an error in the file.

Finally, a line break will define when the PickupLine is cleaved. This allows you to control the exact function before cleaving, offering multiple picks.

PRODUCING A COMMAND

We're now ready to combine everything above into a command, continuing from the earlier example (where we set our source plate as a 96 MWP, and our target as an SBS agar plate with density 96). We're going to pin from well A1 to the first 4 positions A1-A4.

The headings are shown for instruction only, and should not be included in the final files.

From	X	Y	To	X	Y
SourcePlate1	A	1	TargetPlate1	A	1
SourcePlate1	A	1	TargetPlate1	A	2
SourcePlate1	A	1	TargetPlate1	A	3
SourcePlate1	A	1	TargetPlate1	A	4

CREATING A RE-ARRAY FILE

COMBING THE FILE

We've now defined all of the required parameters, and input our desired picking locations, let's combine these into the final file:

SourcePlate1	MWP	96	Source		
TargetPlate1	SBS	96	Target		
SourcePlate1	A	1	TargetPlate1	A	1
SourcePlate1	A	1	TargetPlate1	A	2
SourcePlate1	A	1	TargetPlate1	A	3
SourcePlate1	A	1	TargetPlate1	A	4

Export this as tab-separated values (.tsv) or comma-separated values (.csv), a .tsv file will look like this:

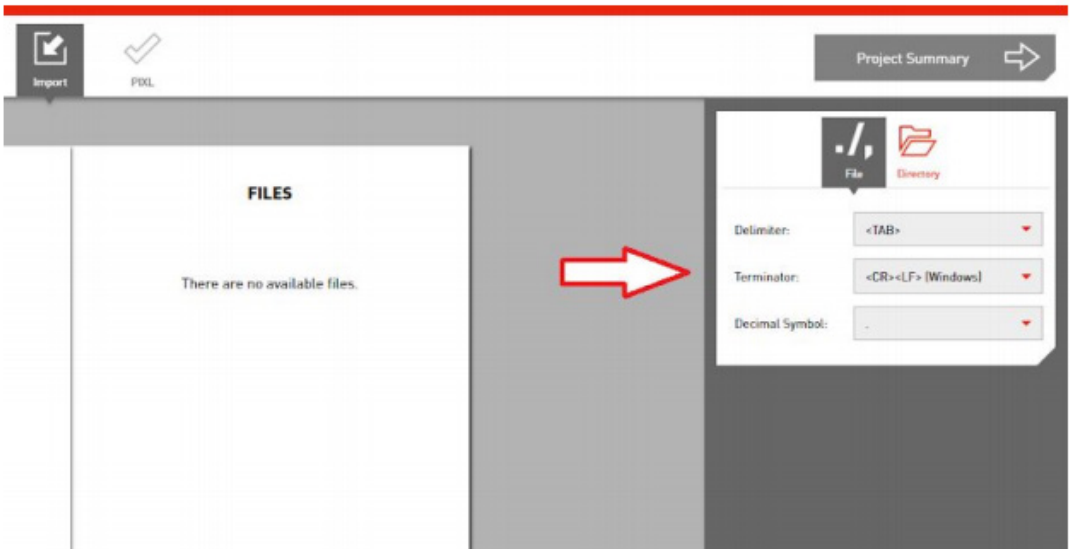
SourcePlate1	MWP	96	Source		
TargetPlate1	SBS	96	Target		
SourcePlate1	A	1	TargetPlate1	A	1
SourcePlate1	A	1	TargetPlate1	A	2
SourcePlate1	A	1	TargetPlate1	A	3
SourcePlate1	A	1	TargetPlate1	A	4
SourcePlate1	A	1	TargetPlate1	A	5
SourcePlate1	A	1	TargetPlate1	A	6

LOADING ONTO PIXL

Now the file is finished and exported as either a CSV or TSV file, save that to a USB stick and upload this onto PIXL. Run the Re-array program and select your file - PIXL will quickly scan the file to make sure there are no errors, it will either show a green tick, or a red cross and explain where the errors are. Depending on the file type you've used, you may need to alter the settings, click on 'Edit' and 'File', make sure the drop down boxes are correct for your file delimiter, terminator and decimal. Change these as required. Check out the picture below to see where this is!

Put in the plates, and... done; PIXL Master 2.0!
There's some more sample files below and some FAQs. Please contact us if you're having any issues or need help.

For more examples of PIXL re-array files, check out our Technical Support site: http://bit.ly/pixlrearray



NOTES

NOTES

NOTES

NOTES

SINGER INSTRUMENTS

A RESPONSIBILITY TO SCIENCE!

Roadwater
Watchet
Somerset
TA23 0RE
UK

+44 (0)1984 640226 (tel)
+44 (0)1984 641166 (fax)

contact@singerinstruments.com
singerinstruments.com

SCAN TO VISIT WEBSITE FOR MORE HELPFUL TIPS AND TUTORIALS!

/SingerInstruments