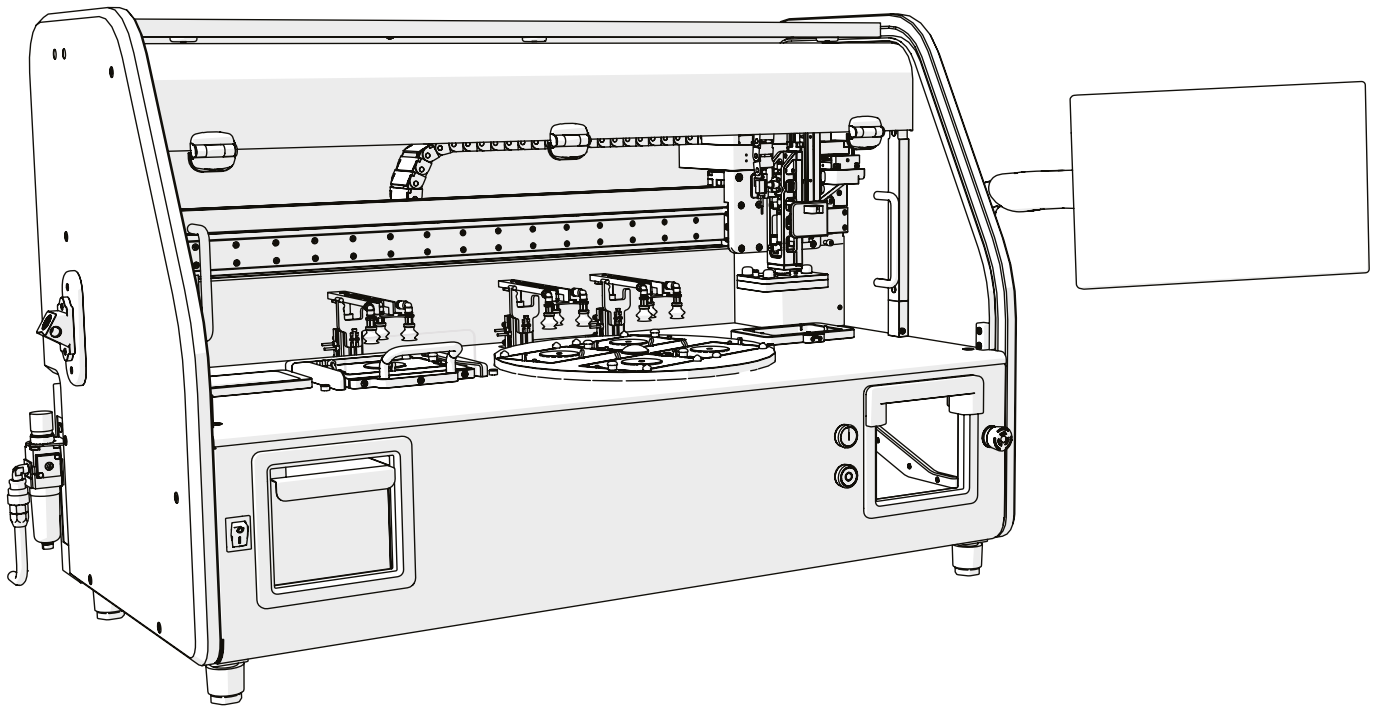
SINGER INSTRUMENTS
A RESPONSIBILITY TO SCIENCE!

ROTOR+™

USER GUIDE v1.7



BEFORE YOU START!

- All on-screen instructions MUST be followed. Straying from the on-screen instructions could cause damage to the machine and the user.
- Keep transit hardware in a safe place. These will be required should the ROTOR+ require moving.
- During Pad Head removal, always ensure the push cylinder is cleared before moving away from the carriage. The push cylinder runs from the carriage arm into The Stinger/Pad Head. If either are not pulled down far enough during removal, the cylinder will catch and damage the ROTOR+.
- Always turn power OFF before changing heads. Leaving the power on can cause a hardware crash. Ensure you follow on-screen instructions when changing heads.

For more support resources visit **bit.ly/ROTORhelp**

ROTOR+™

The ROTOR+ is a compact benchtop robot for easy, ultra-fast manipulation of high-density arrays of yeast, other fungi and bacteria. Reagent sets such as deletion mutant collections and the complete set of cloned yeast genes can be utilised for high-throughput screens; large-scale 2-hybrid, synthetic genetic array, phenotypic and chemical-genetic analysis. The ROTOR+ uses plastic replica plating pads (RePads™) and supports liquid pinning to and from 96 and 384-well microtitre plates and agar pinning at densities of 96, 192, 384, 768, 1536 and 6144.

The information in this guide relates to software version: 5.22.0805.1

JOIN OUR DISCOVERY COMMUNITY!

Join our Discovery community and help us to 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 to join.

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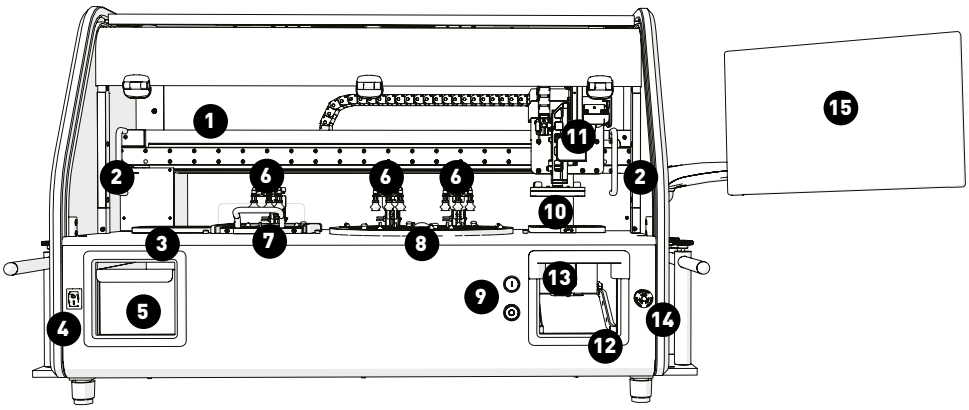
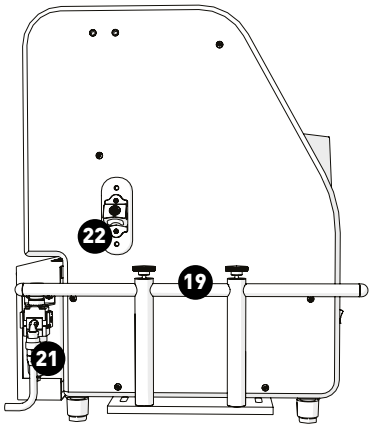
ANATOMY

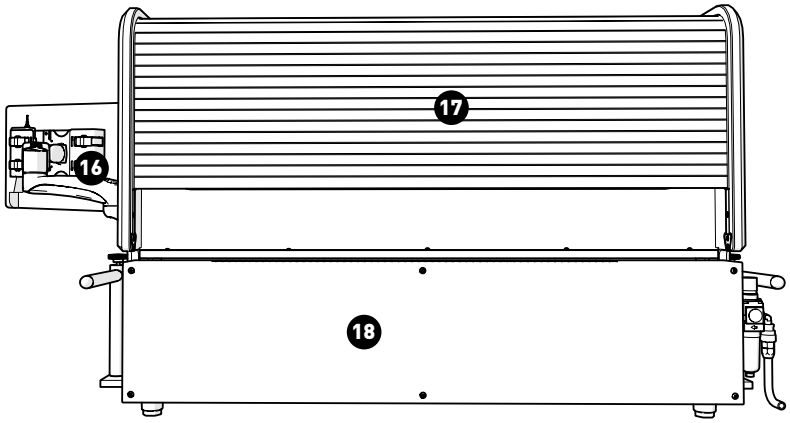
FRONT



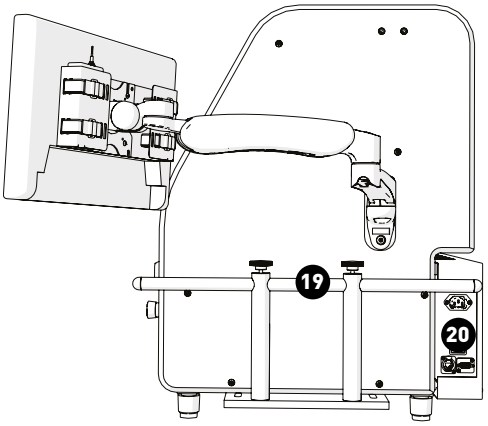
LEFT



BACK



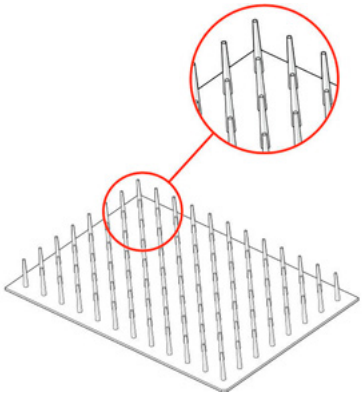
RIGHT



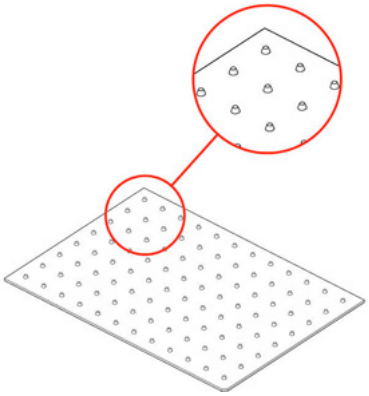
1. Protective Screen
2. Screen Handles
3. Dump Zone
4. Power Switch
5. Dump Drawer
6. Lid Lifters
7. Black Bay
8. Turntable
9. Fast Buttons
10. Pad Head
11. Carriage Arm
12. Hopper Loading Bay
13. Pad Hopper
14. Emergency Stop
15. MCI Touch Screen
16. MCI Mounting Arm
17. UV Decontamination Cover
18. Control Panel
19. Transit Brackets*
20. Power Socket
21. Air Line Connection
22. Bottle Opener

*Ensure to keep transit Brackets in a safe place should the ROTOR+ ever require moving.

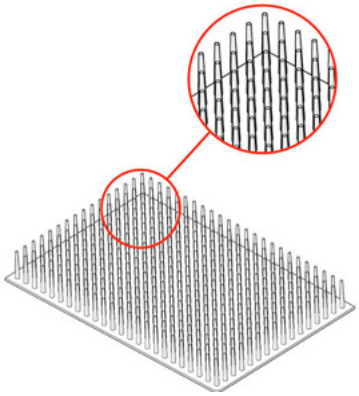
REPADS™



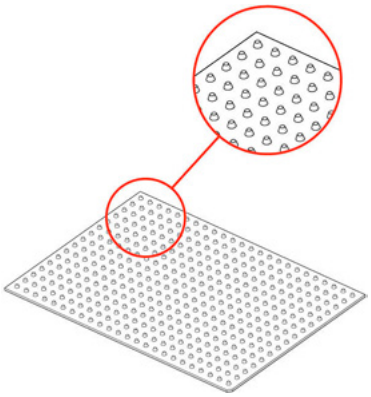
96 LONG
MEDIA: Solid agar, Liquid
PINNING DENSITIES: 96, 192, 384, 1536



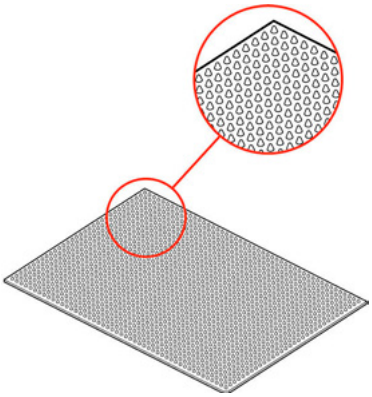
96 SHORT
MEDIA: Solid agar
PINNING DENSITIES: 96, 192, 384, 1536



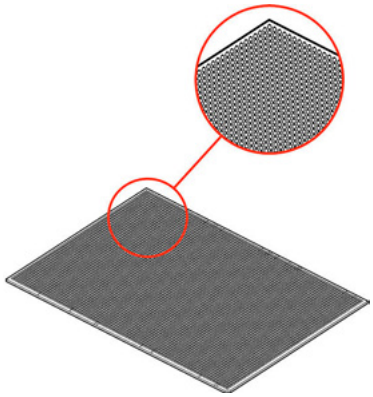
384 LONG
MEDIA: Solid agar, Liquid
PINNING DENSITIES: 384, 768, 1536, 6144



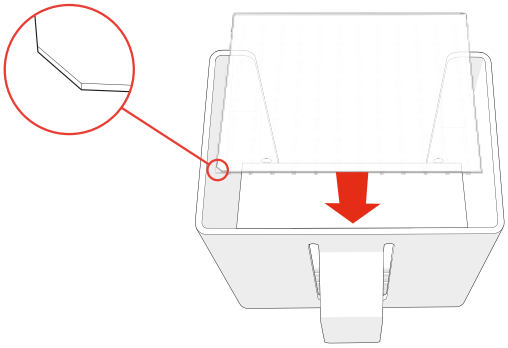
384 SHORT
MEDIA: Solid agar
PINNING DENSITIES: 384, 768, 1536, 6144



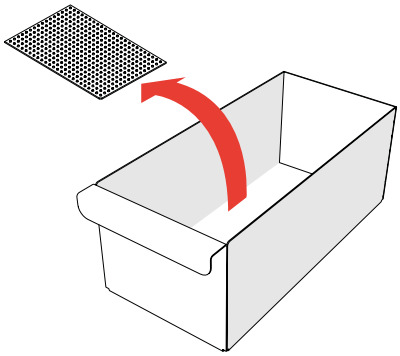
1536 SHORT
MEDIA: Solid agar
PINNING DENSITIES: 1536, 3072, 6144, 24567



6144 SHORT
MEDIA: Solid agar, Liquid
PINNING DENSITIES: 6144, 12288, 24567

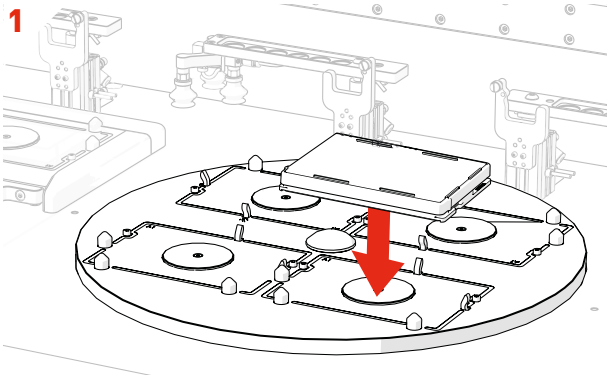


PAD HOPPER
- Load your RePads™ (pins facing down) into the Hopper as shown. The Pad Hopper is fully autoclavable.
- You will be instructed on-screen when to load your RePads.



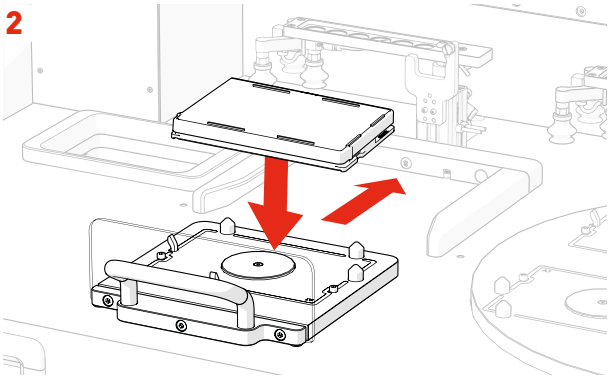
DUMP DRAWER
- Used RePads™ are dropped into the Dump Drawer. When a program is finished, it can be removed to dispose of the used RePads™. The Dump Drawer is fully autoclavable.
- New RePads can be purchased from our online shop: singerinstruments.com/shop

1



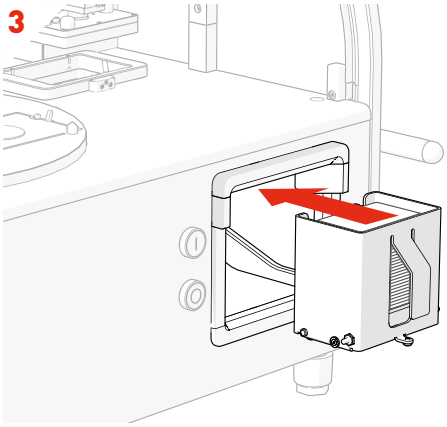
- Plates are loaded (lids on) into the Turntable.
- The front two plates are loaded first. The turntable will rotate to allow you to load two more plates.
- Plates will sit loose in the bays until the program starts. The plates will then be gripped securely in place.

2



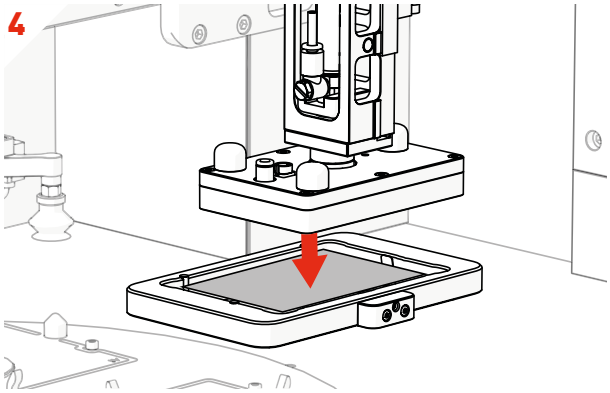
- A plate can also be loaded (lid on) into the Black Bay. This gives the ROTOR+ a 5 plate capacity. The turntable can rotate throughout the program allowing you to swap in new plates, creating a limitless capacity.
- Plate bays are colour coded and the software will tell you where to correctly load your plates.

3



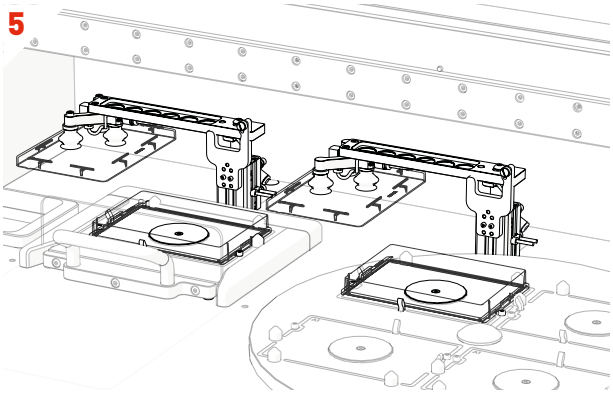
- RePads are loaded (pins facing down) into the Pad Hopper. RePads come in a variety of densities and are used to transfer strains from Source Plates to Target Plates.

4



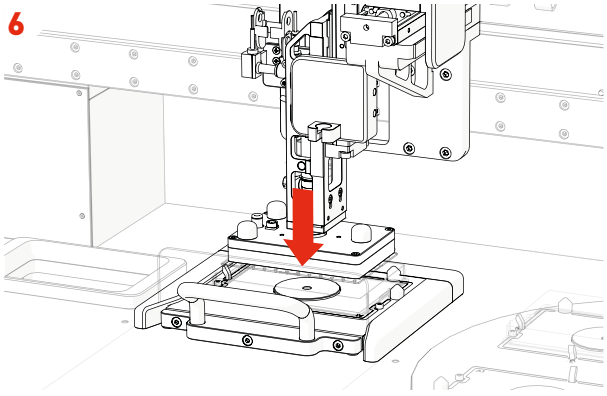
- The Pad Head lowers and picks up a RePad.

5



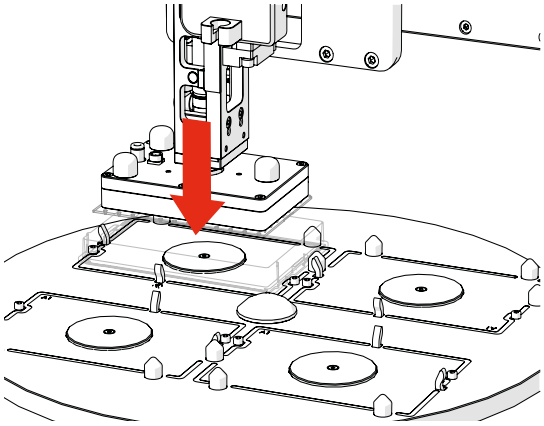
- Plate lids are automatically removed from the plates ready for pinning.

6



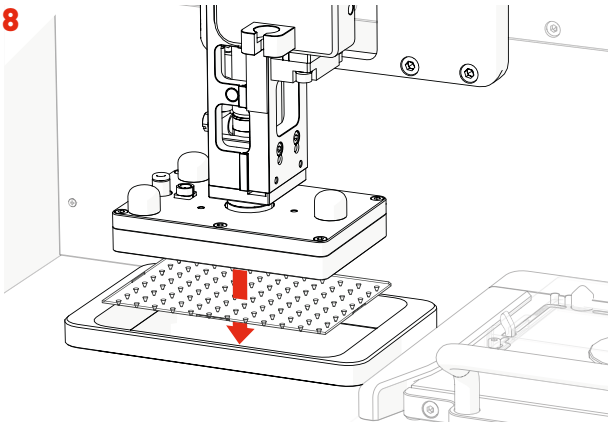
- The Pad Head moves to the Source Plate, lowers and collects a sample of cells.

7



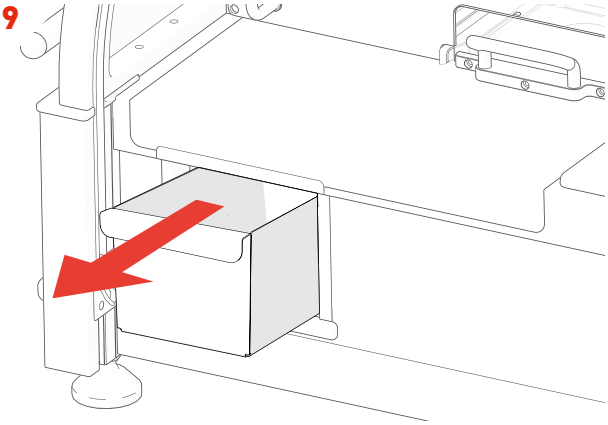
- The Pad Head moves to a Target Plate and deposits the sample of cells.

8



- The Pad Head moves to the Dump Zone and drops the used RePad.
- These steps will be repeated until your chosen program is finished.
- The software will guide you through any necessary plate swapping throughout the program.

9

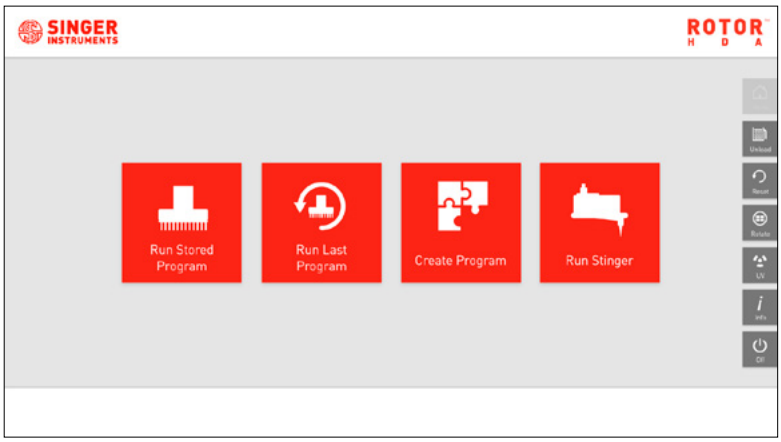


- Used RePads are collected in the autoclavable Dump Drawer ready to be disposed of when you're finished.

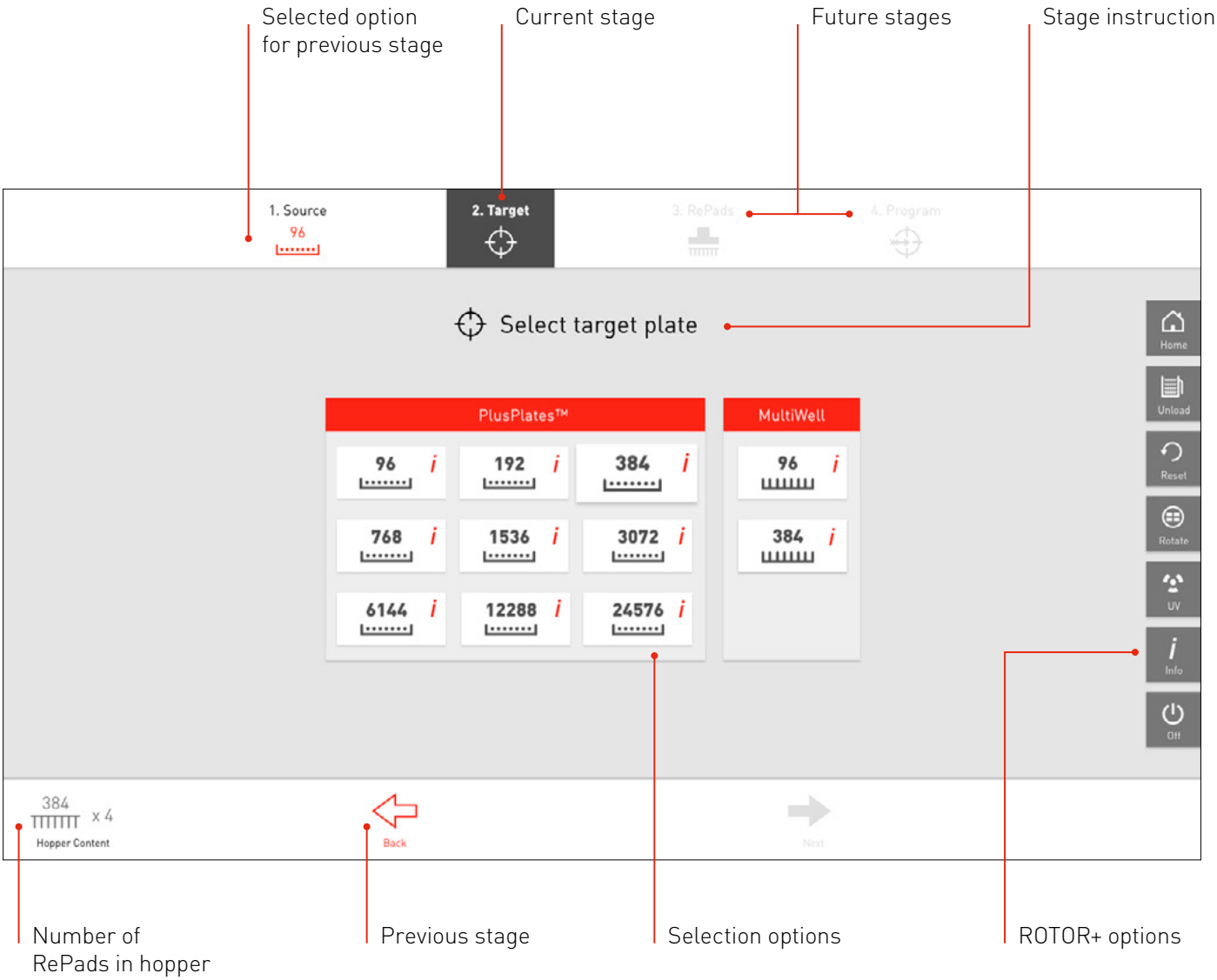
SOFTWARE OVERVIEW

HOME SCREEN

- There are four main options on the ROTOR+ Home Menu:
- **Run Stored Program** - Select your plate types and choose from a list of compatible ROTOR+ programs.
- **Run Last Program** - Run the last program performed.
- **Create Program** - Create a new ROTOR+ program.
- **Run Stinger** - If you have a Stinger add-on for the ROTOR+, you can run single colony picking programs from here.



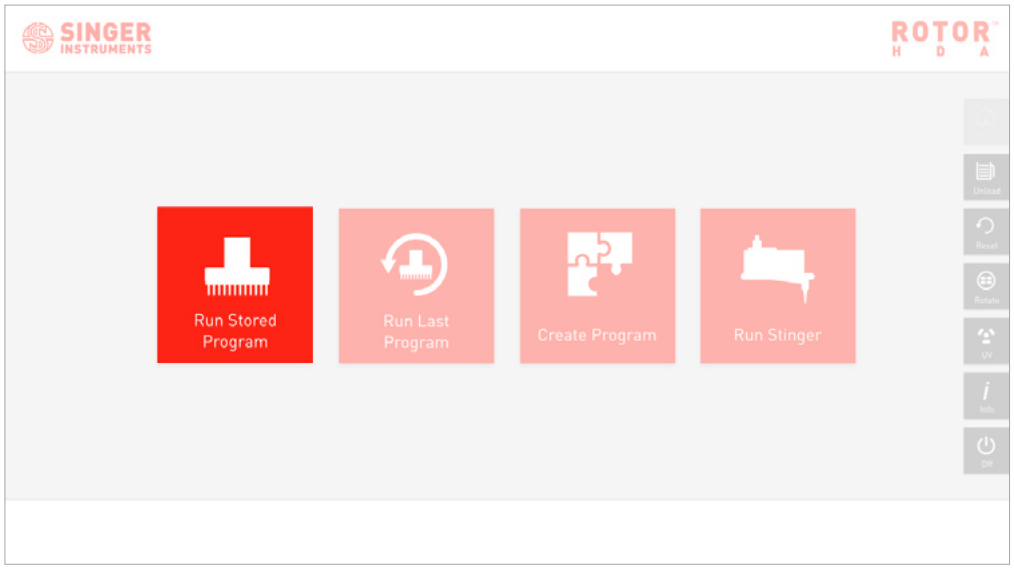
PROGRAM SCREEN



RUN STORED PROGRAMS

Let's take a quick tour of the Run Stored Programs option to get you started with ROTOR+. This is your go-to mode for running ROTOR+. Here you can run any of the programs that come with ROTOR+ as well as any user-created programs.

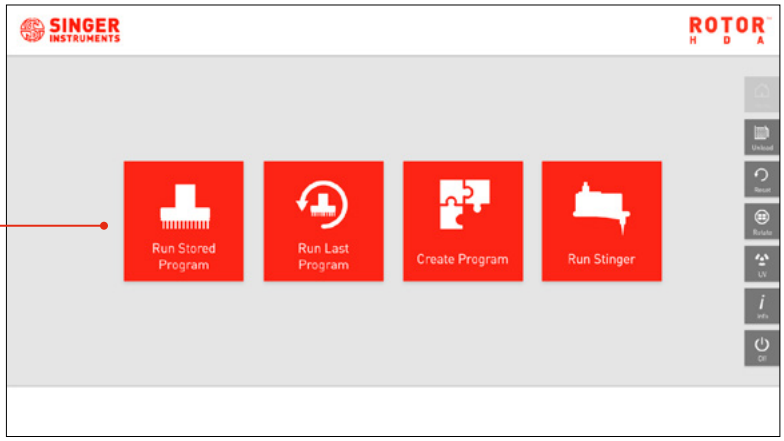
Click **Run Stored Program** on the home screen.



RUN STORED PROGRAM

1.

· Select Run Stored Programs.



2.

· Select a source plate from the options on screen.

· Source plates are the plates that already have the desired strains on. The source could be colonies grown on solid agar, or cultures grown in liquid media. In solid agar, the ROTOR+ currently supports colony density up to 24576. In liquid media, ROTOR+ supports multi-well and deep well plates at 96 and 384-density.

· In this example we select 96-Density PlusPlate. Selecting a plate will move you to the next stage. Press the back button to edit your choice.

3.

· Select a target plate from the options on screen.

· Target plates are the plates that you want your desired strains to grow on. The types of target plates available are only those compatible with your previous selection.

· To view the details of specific plates, click the *i* icon.

· In this example we select 96-Density PlusPlate.

RUN STORED PROGRAM

· Example of plate details.

4

· Select a RePad from the options on screen.

· The RePads available are only those compatible with your previous selection.

· In this example we select 96-Density Short Pin.

· NOTE: Short pin pads are used to pin colonies from solid agar to solid agar. Long pin pads are used to pin liquid media or solid agar to solid agar or liquid media.

5

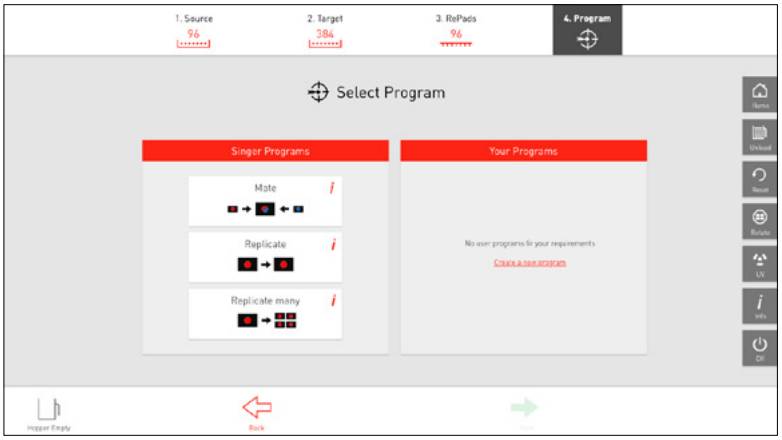
· Select a program from the options on screen.

· The programs available are only those compatible with your previous selection. In this example, there are three available programs:

· *Mate* - pinning two haploid cells onto one plate.
· *Replicate* – pinning one source plate onto one target plate.
· *Replicate Many* – pining one source plate onto multiple target plates. See pinning examples on page 35.

· The right-hand panel will display your compatible custom programs. You also have the option to create new custom programs. See how on page 15.

· In this example, we select *Replicate Many*.



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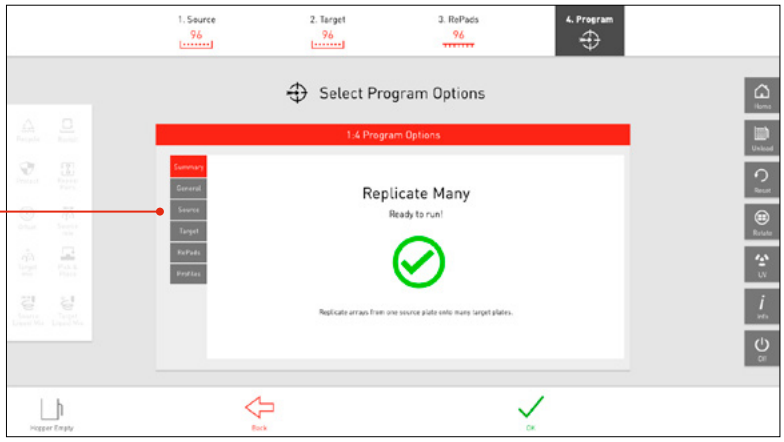
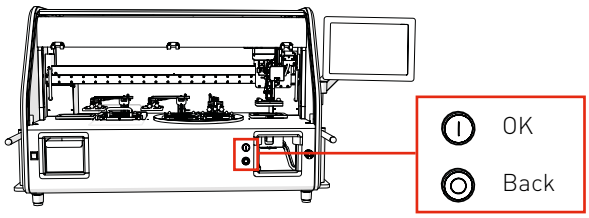


· Here you can fine-tune the program options using the options on the left. A detailed overview of these options can be found on pages 30-33.

· For the rest of the program set-up, press OK to continue or use the Fast Buttons on the front of the ROTOR+:



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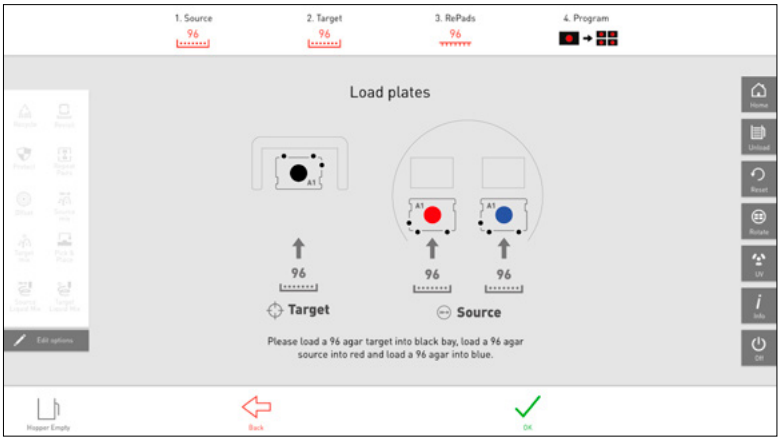


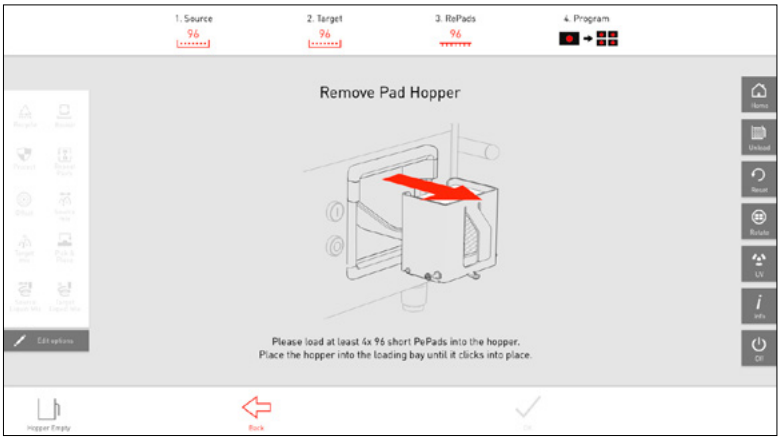
· Simple, step-by-step instructions will guide you through the program. Each plate position is colour coded. Red, blue, yellow and green go into the ROTOR+ Turntable, while black goes into the ROTOR+ Black Bay.

· Load the plates as described on screen and press OK or use the Fast Buttons when you are done.

= Source Plate

= Target Plate

8

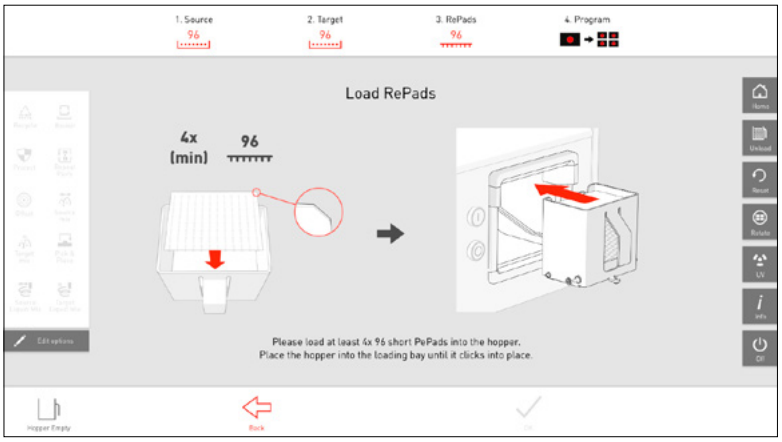


· When prompted, remove the Pad Hopper to load the RePads.

RUN STORED PROGRAM

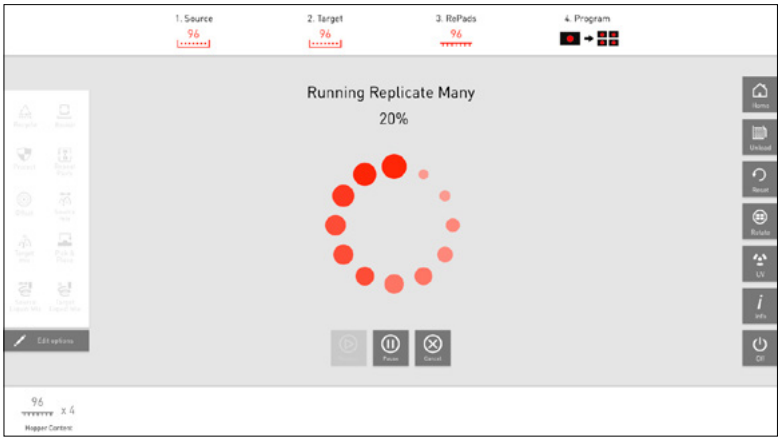
9

- Follow the instructions and load the appropriate RePads into the Pad Hopper.
- Load the Pad Hopper back into the loading bay until it clicks into place.
- Once loaded, the ROTOR+ will count the RePads in the Hopper and start running the program.



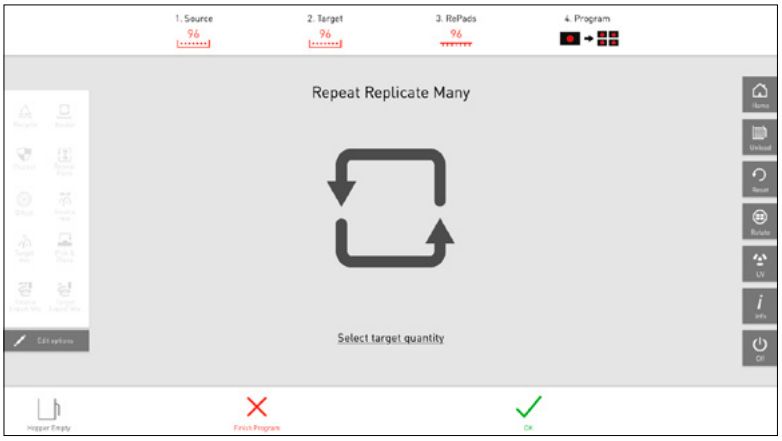
10

- The ROTOR+ will now start pinning the colonies for replication.
- You can toggle program options on and off using the left menu. Click Edit Options to bring up the program options window.
- Quick button operation: Pause and Resume.
- On-screen operation: Resume, pause, stop / abort.



11

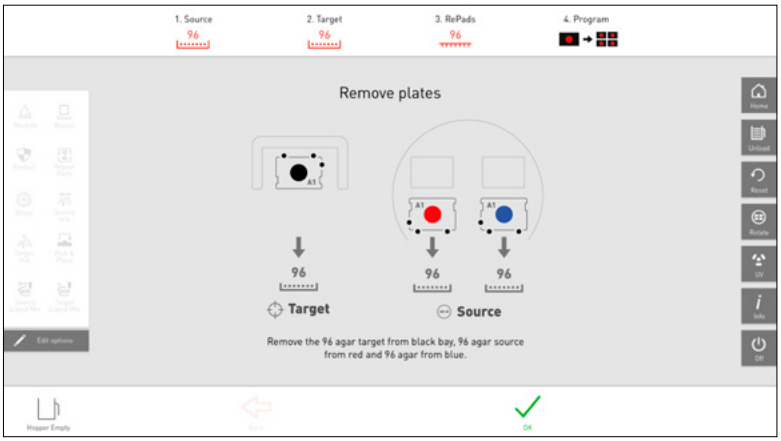
- If you want to do more than 4 replicates of a target plate, you can repeat the program by pressing OK. If not, you can finish program.



12

· Remove the plates as described on screen.

· When done press OK.



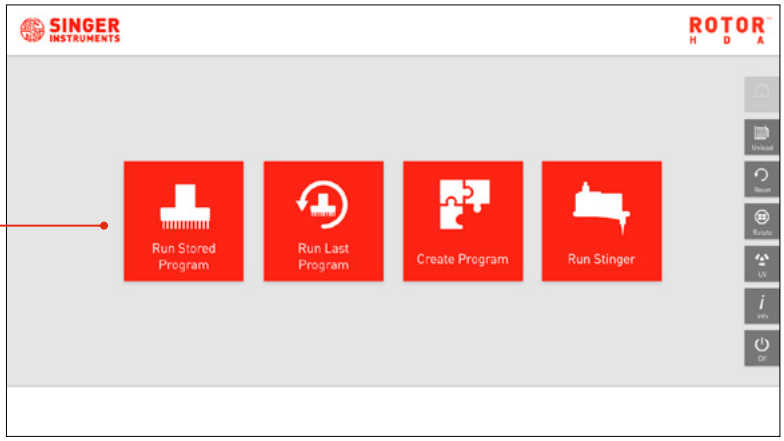
13

· The summary screen shows you information about the completed program.

· Click OK to finish.

· Boom! You just completed your first ROTOR+ program!

· To re-run the last program, from the home screen click Run Last Program.

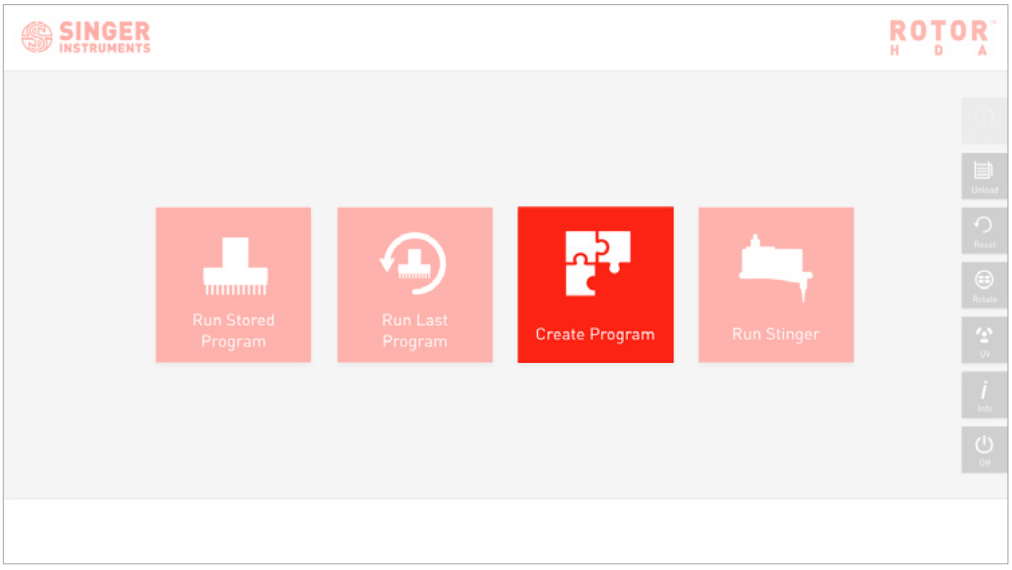


CREATE PROGRAM

ROTOR+ comes with lots of programs to get you started, but you also have the option to create your own programs. This next section takes you through the 3 options for creating programs:

Manual Programming - Move the pad head in real-time to create a program.
Advanced Programming - Build a program from a list of routines
Based on Existing - Use an existing program as a starting point.

Click *Run Stored Program* on the home screen.



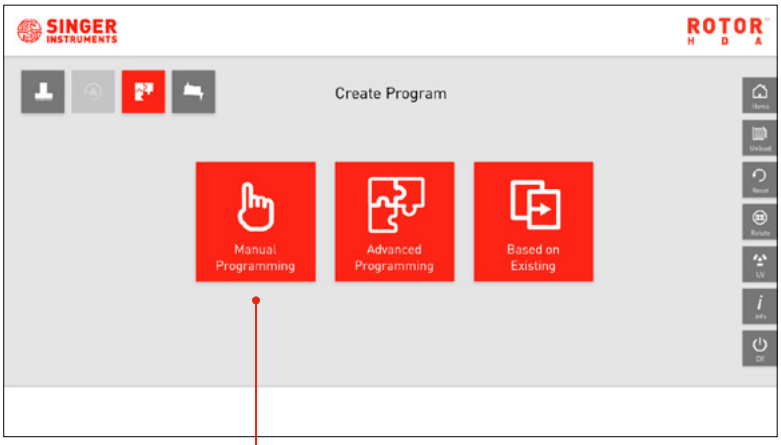
MANUAL PROGRAMMING

1

· Manual programming let's you create a program live, one step at the time. Load all your pads and plates, click which plate you want to travel to first, click Pin and you'll see the ROTOR+ pin that plate in real time.

· When you've done everything you want to do, you have the option to save all the steps as a program that you can use again in the future.

· Select **Manual Programming**.

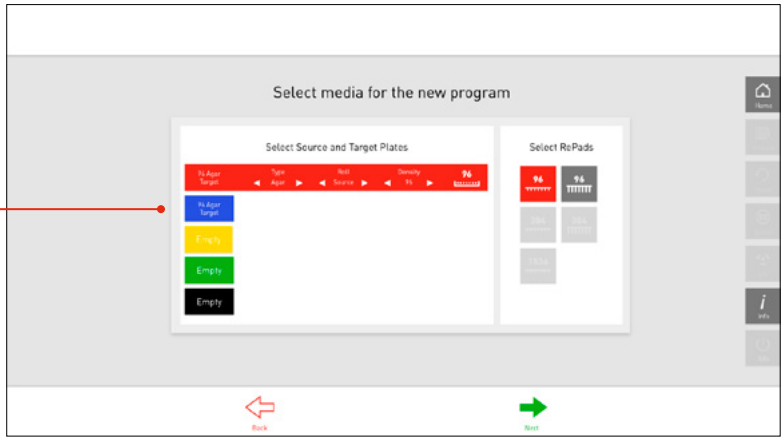


2

· The screen shows the 5 colour-coded plate bay.

· Click a plate bay and select your plate details.

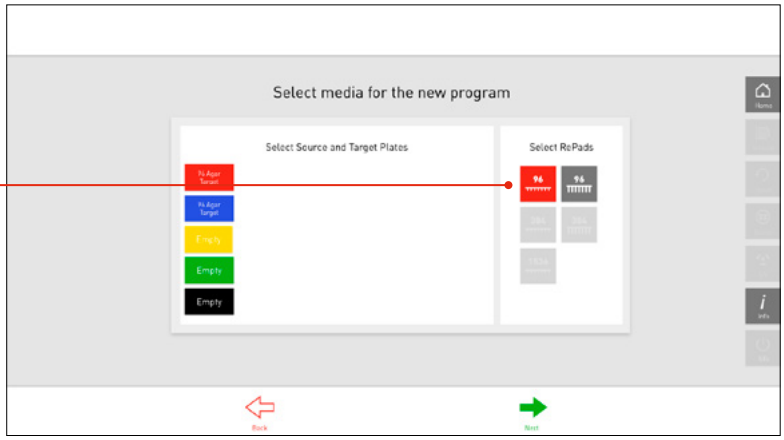
· Remember:
Source is the plate that contains the colonies you want to pick.
Target is the plate you want to pin the colonies on.



3

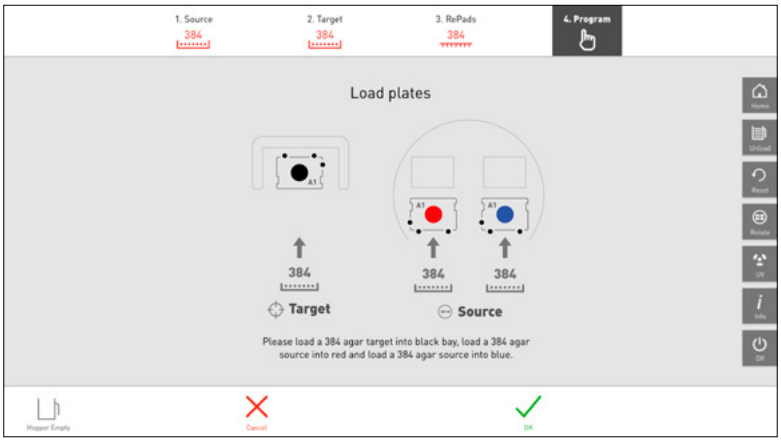
· Select the RePad you want to use from the available options.

Click **Next** to start building the program.



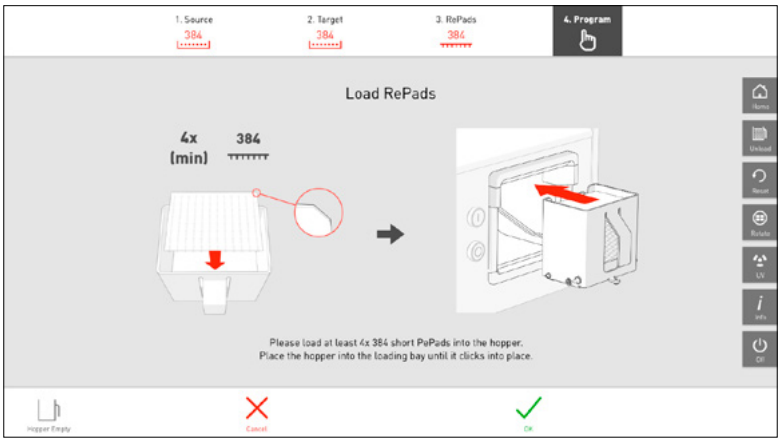
4

- Load the plates you specified on the selection screen.
- In this example we'll be mating two 384-density agar plates onto one 384-density agar plate.



5

- Load the RePads you specified on the selection screen.

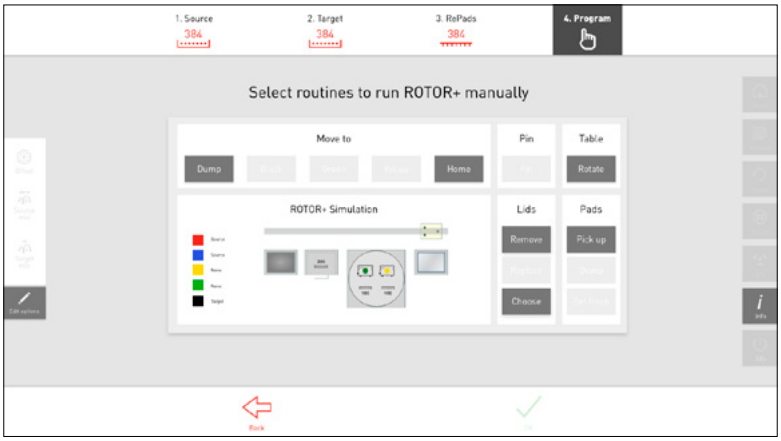


6

- This is the manual routine screen. Here you can manually control the ROTOR+ in real time. There are 5 groups of commands:

  Move to - Select where the Pad Head should move.
  Pin - Pin in the Pad Head's current location.
  Table - Rotate the turntable to access other plates.
  Lids - Remove or replace all or specific plate lids.
  Pads - Pick up or dump RePads.

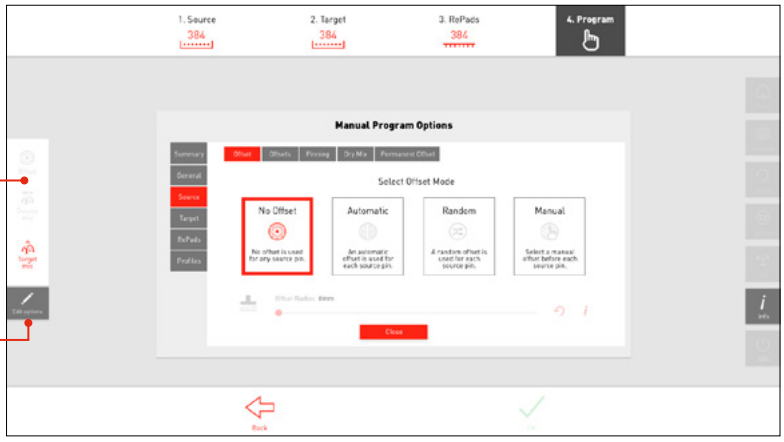
- Click through these options to build your desired routine. The ROTOR+ will perform these options as you go. There is also a simulated view on screen as well.
- NOTE: Only possible options are displayed. E.g. You can't dump a pad if there is no pad on the Pad Head.



7

- You can enable program option such as offsets and mixing in the menu on the left.

- To edit these option, click **Edit Options**. This gives you access to the **Program Options Menu**.

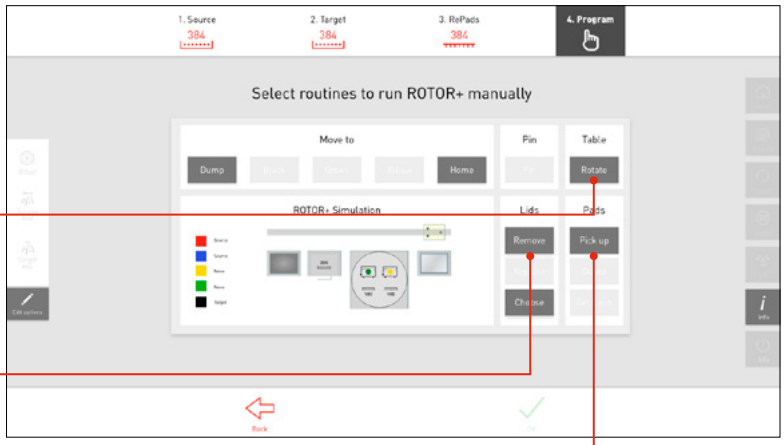


8

- In this program, the first thing we'll do is press **Rotate** to rotate the turntable which will put our source plates into the picking zone.

- Now our plates are all in place, we'll remove their lids by clicking **Remove**.

- Before we can pin anything we need to pick up a RePad. Click **Pick Up**.

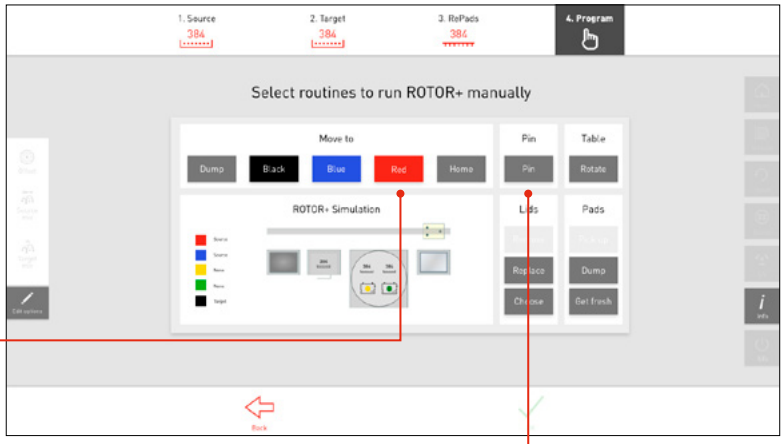


9

- The lids have been removed and we've picked up a RePad, now we can pin something!

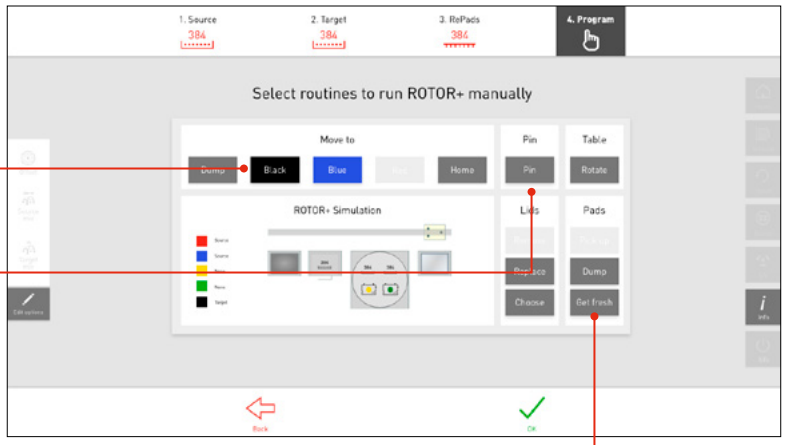
- We want to pick up colonies from the Red Bay and pin them into the Black Bay. The first step is to move the Pad Head to the Red Bay by clicking **Red** in the **Move to** actions group.

- You'll see the Pad Head move to the Red Bay. To pin, click **Pin**.



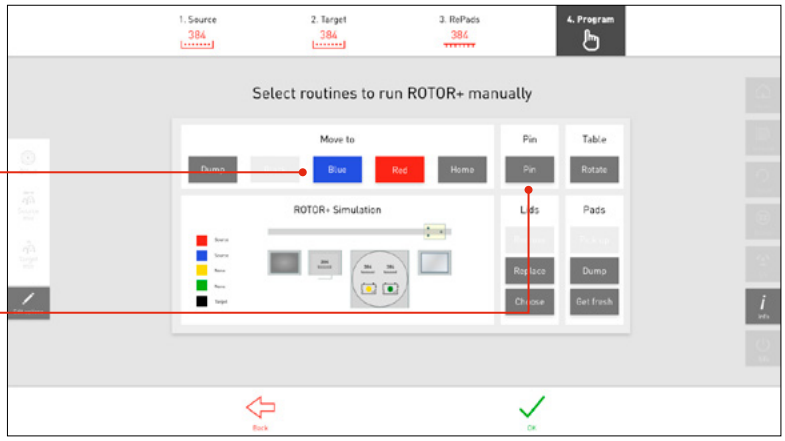
10

- We'll now click **Black**, to move the Pad Head to the Black Bay.
- And click **Pin**, to pin to the target plate.
- The ROTOR+ has now picked up colonies from the Red Bay and pinned them to the Black Bay. We want to do the same with the Blue Bay, but first we have to dump the RePad to stop any cross contamination.
- Because we want to pick up a new pad after we dump the current one we can click **Get Fresh**. This will dump the current pad and pick up a new one.



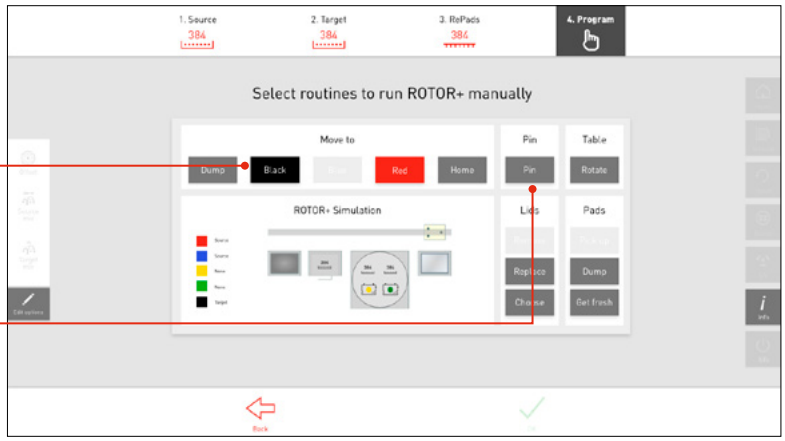
11

- We have a new RePad so let's move the Pad Head to the Blue Bay by clicking **Blue**.
- You'll see the Pad Head move to the Blue Bay. To pin, click **Pin**.



12

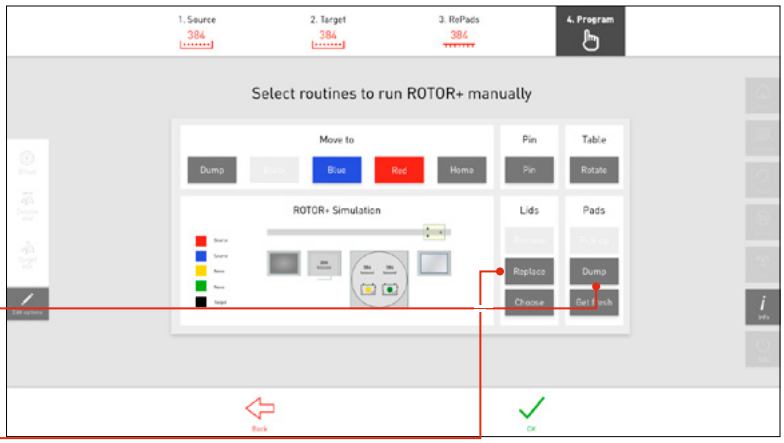
- We'll now click **Black**, to move the Pad Head to the Black Bay.
- And click **Pin**, to pin to the target plate. If you want to add any mixing options, you can use the options on the left of the screen before clicking Pin.
- The colonies from the Blue Bay have now also been pinned onto the plate in the Black Bay.



13

- This is everything we want to pin for this program so the last thing to do is get rid of our used RePad and replace the plate lids.

- Because we don't need any more RePads we can simply press Dump in the Pad options.

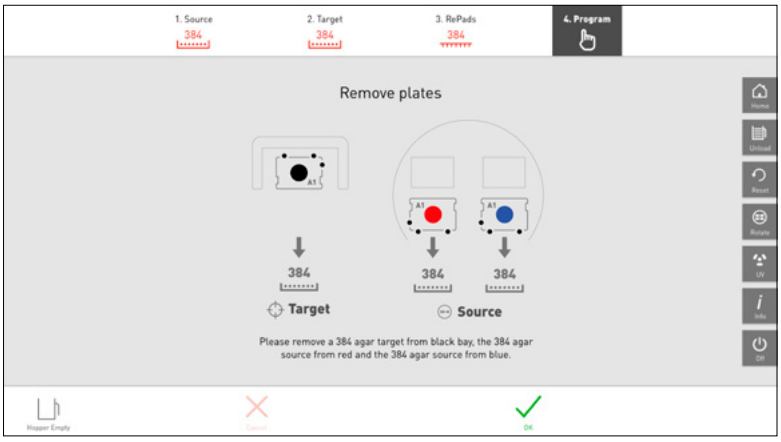


- Click Replace to replace the plate lids.

- Click OK to finish.

14

- Remove the plates, as described on screen.



15

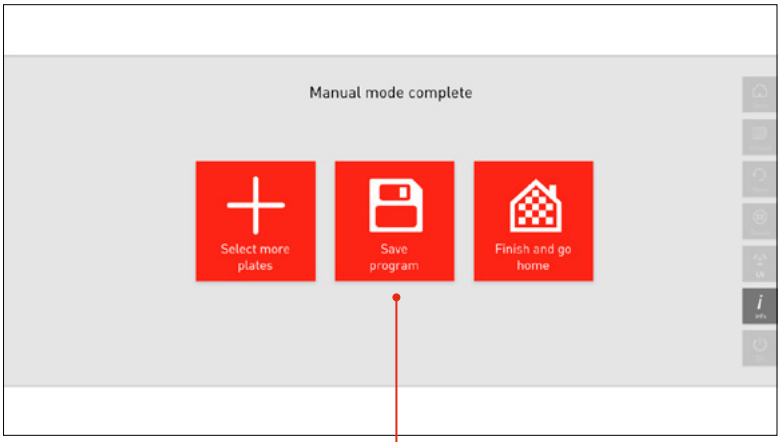
- You now have 3 options:

Select more plates - This gives you the option to go back to your program and add more plates to pin.

Save program - This will optimise and save the program so it can be used again in the future.

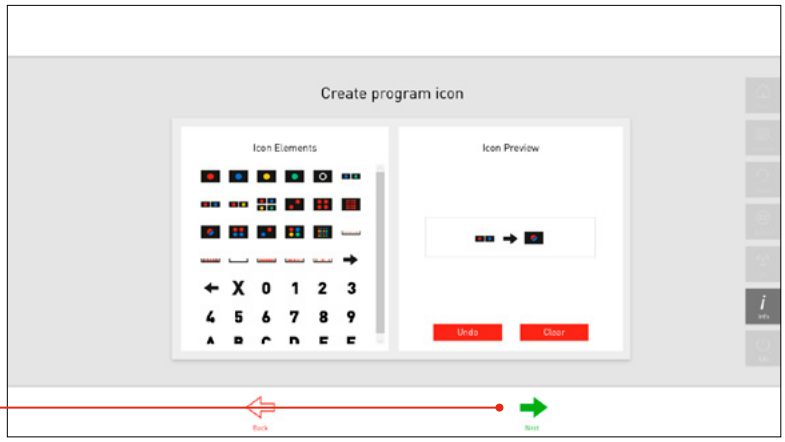
Finish and go home - If this was a one-off program, you can simply finish without saving.

- We'll click Save Routine so we can use it again in the future.



16

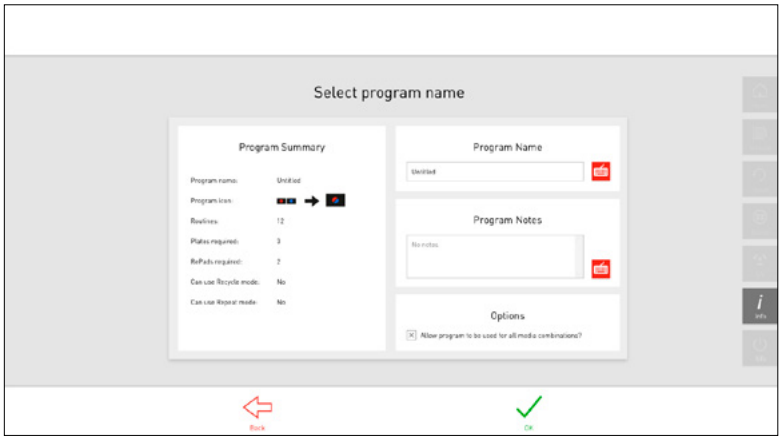
- Create an icon to help you quickly identify the program.
- Click images on the left to build your custom icon.
- Click Next to continue.



17

- Here you can name your program and add any notes.
- Click OK to save your program.
- And that's it! You can now run this program by clicking Run Stored Program on the home screen.

  NOTE: Your program will only be visible if your source, target and RePads match the criteria you selected when creating the program.



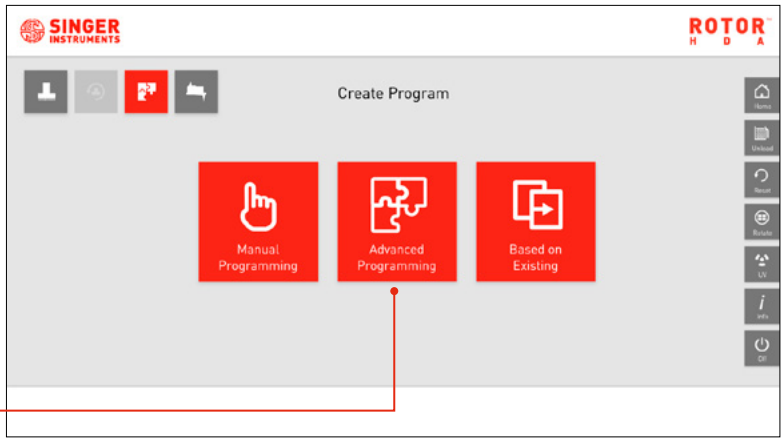
ADVANCED PROGRAMMING

1

· Advanced programming is a lot easier than it sounds! You don't need to script anything, simply build your program from a list of existing routines.

· Unlike the manual programming option, the ROTOR+ hardware will not act out the routines as you select them.

· Select Advance Programming.

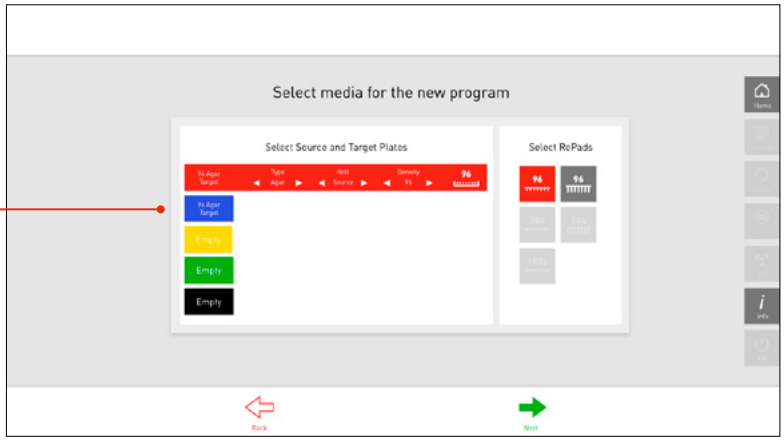


2

· The screen shows the 5 colour-coded plate bay.

· Click a plate bay and select your plate details.

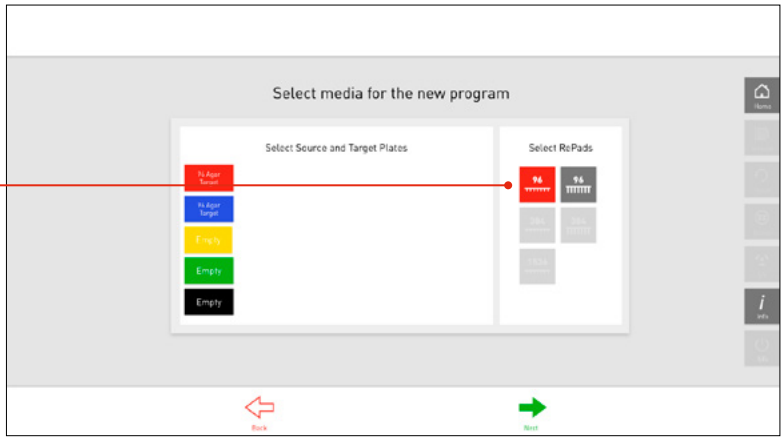
· Remember:
Source is the plate that contains the colonies you want to pick.
Target is the plate you want to pin the colonies on.



3

· Select the RePad you want to use from the available options.

Click Next to start building the program.



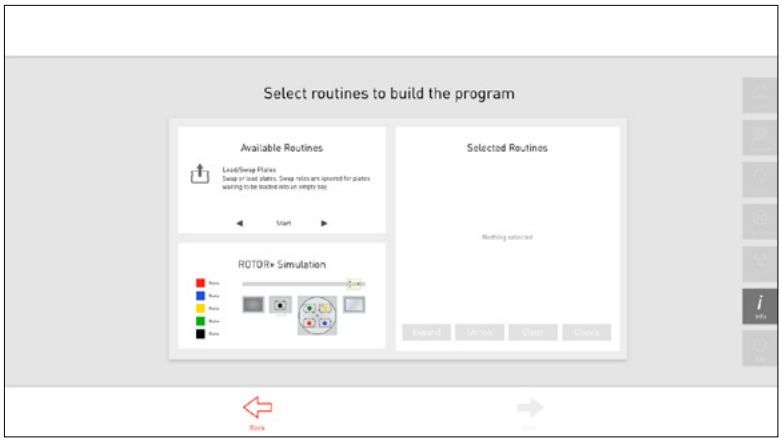
4

- There are 3 sections to the program builder:

Available routines - Contains a list of all the available routines or steps. Click on a routine to add it to your program.

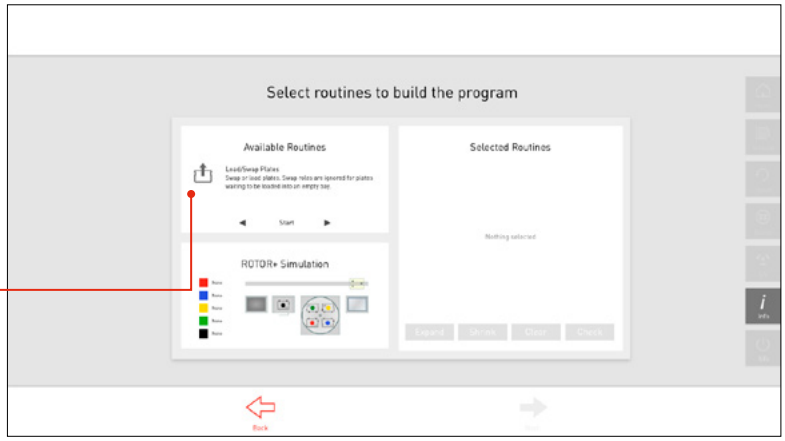
Selected routines - Any routines that you have selected will appear in this section.

ROTOR+ simulation - Shows a diagram of the ROTOR+ deck detailing what is currently loaded and where the pad head is.



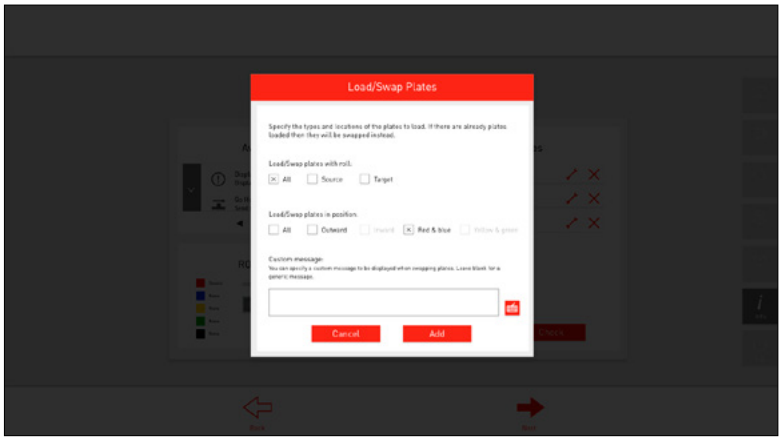
5

- The available routines will change depending on what you have selected, but it's always a good idea to start with loading plates.
- Select Load/Swap Plates from the available routines.



6

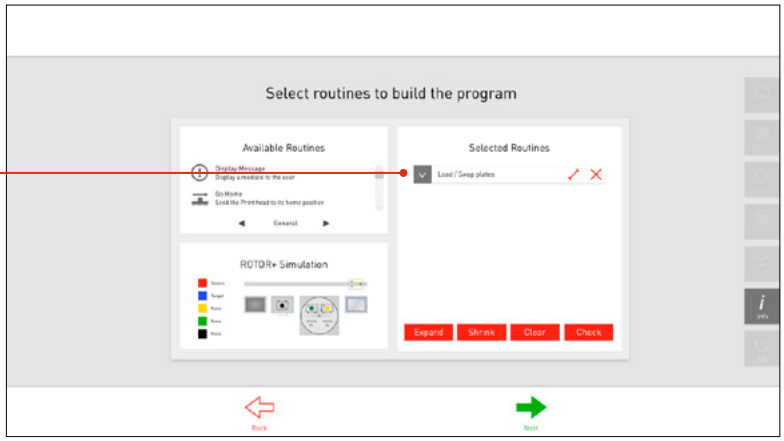
- When you select some routines you will need to add more details.
- After selecting Load/Swap Plates you will need to select their role (source/target) and which bay you want to load them into.
- Click Add to add this routine to your program.



7

· The Load/Swap Plates routine has now been added to your program.

Press to edit the details or to delete if from your program.

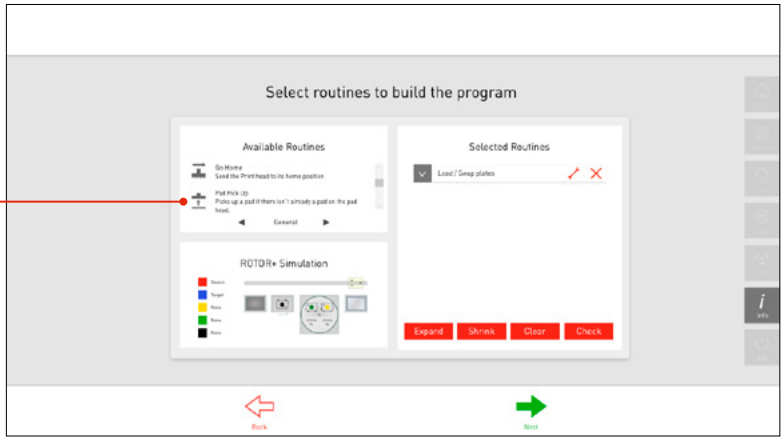


8

· We're going to add a new routine to the program.

· Select Pad Pick Up from the available routines.

· This will pick up a RePad.

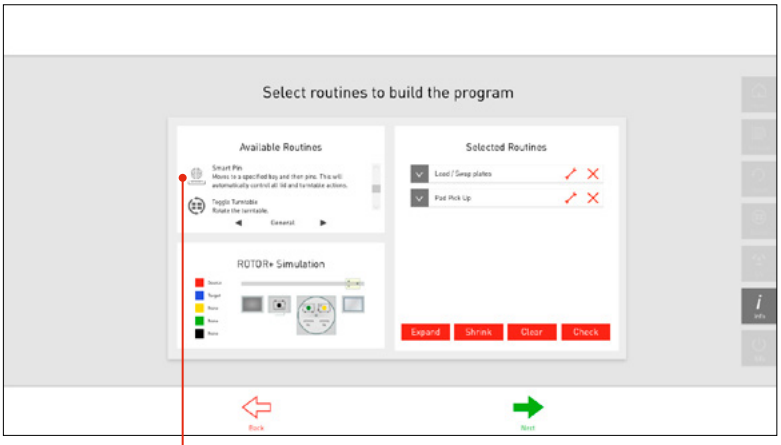


9

· When it comes to pinning a plate, you can add all the steps individually (rotate turntable, remove lid, move to plate, pin plate) but that's a lot of work! If you're new to ROTOR+ we recommend using the Smart Pin routine.

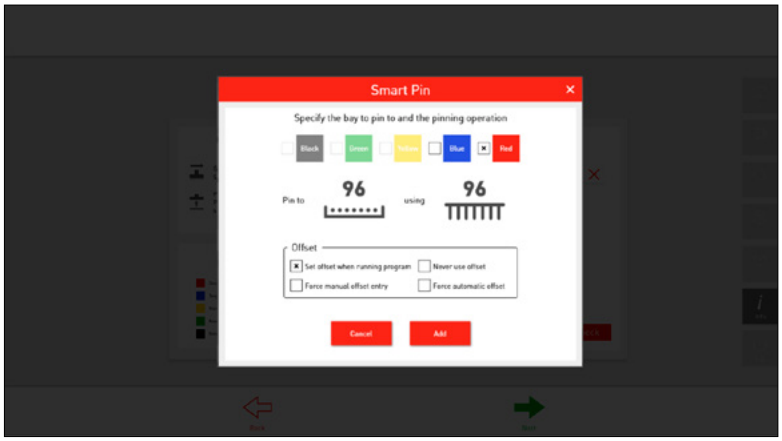
This will automatically add all the necessary steps such as remove lid and move pad head to plate. All you have to do is select which plate you want to pin.

· Scroll down and select the Smart Pin routine.



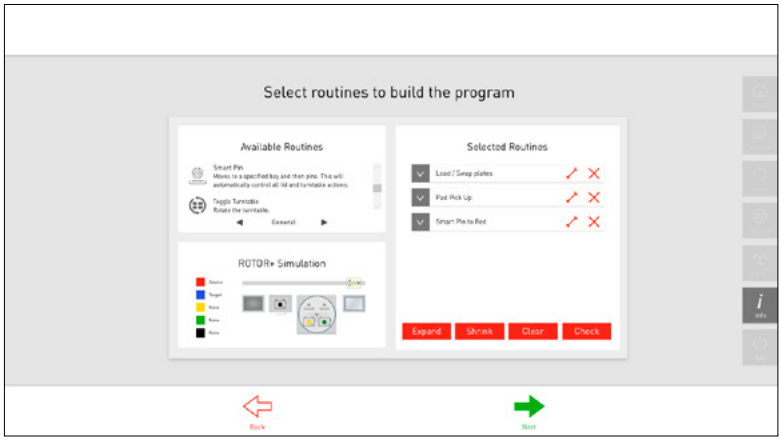
10

- Select which plate bay you want to pin. You can also specify a pinning offset if required.
- Click Add to add this pinning to your program.



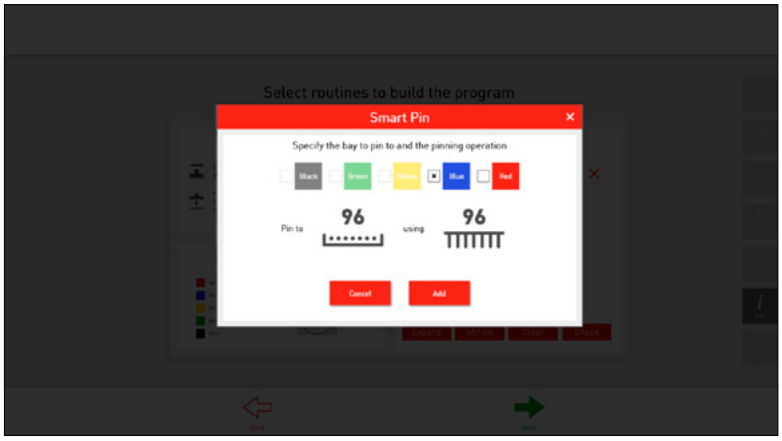
11

- We've added a smart pin to the red plate (the source plate). I now want to pin the blue plate (the target plate).
- Select Smart Pin again.



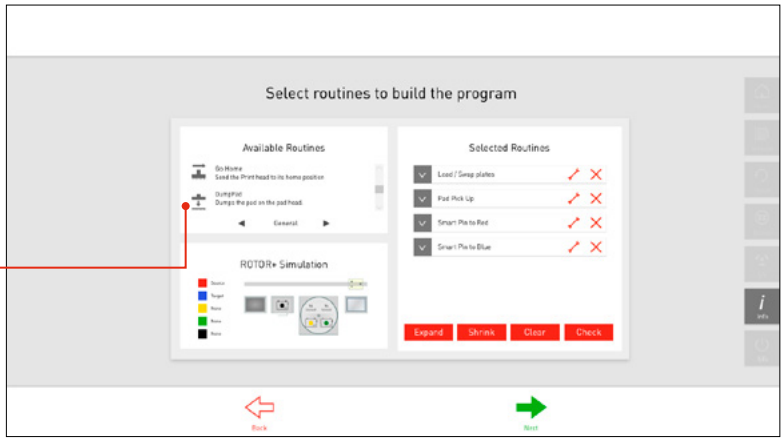
12

- Select the plate you want to pin to. The target plate in this example is in the blue bay.
- Click Add to add this pinning to your program.



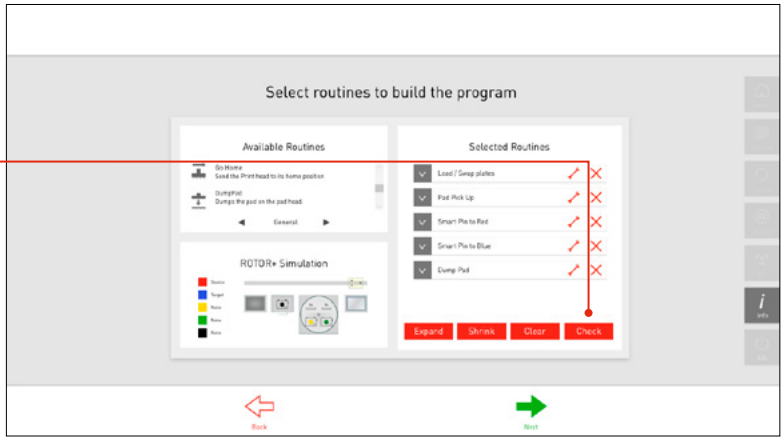
13

- So far we have loaded our plates, picked up a pad, pinned the source plate in the red bay, and pinned the target plate in the blue bay.
- We'll now dump the RePad by selecting **Dump Pad**.



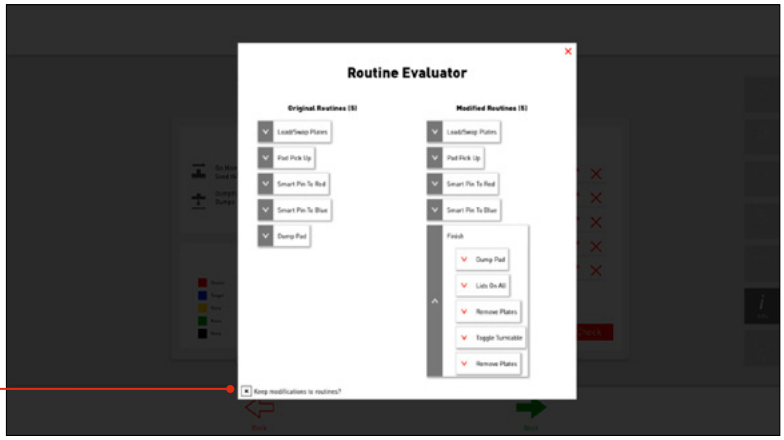
14

- That's all I want to do in this example. When you've added everything you need to pin, click **Check**.
- This will evaluate your routines and make any suggestions regarding missing routines or ways to streamline it.



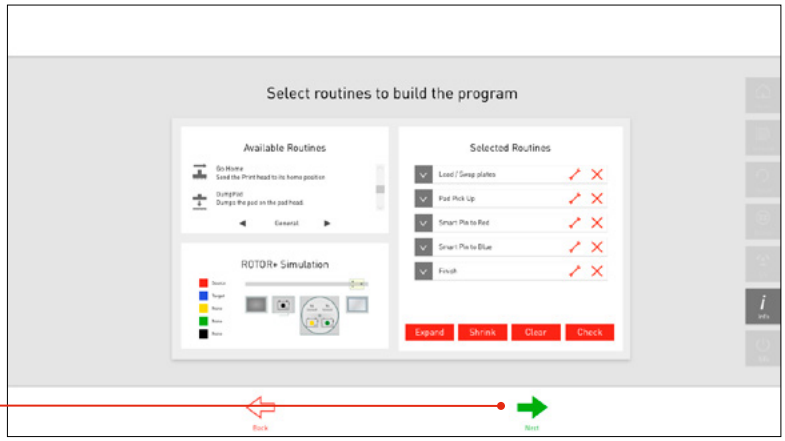
15

- The routine evaluator shows the routines you have selected on the left and the suggested modifications on the right. Here the modified routines as added all the necessary routines to complete the program such as replacing the lids and removing the plates.
- Click the **Keep Modifications** check box to accept the changes and then close the window.



16

· When you're happy with your program, click **Next** to continue.

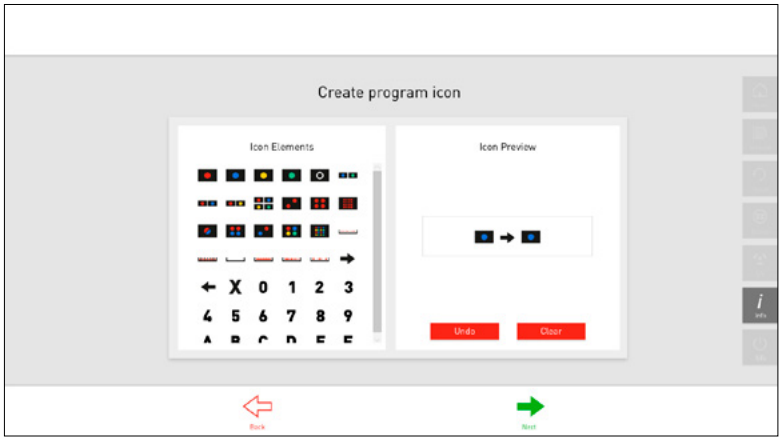


17

· Create an icon to help you quickly identify the program.

· Click images on the left to build your custom icon.

· Click **Next** to continue.



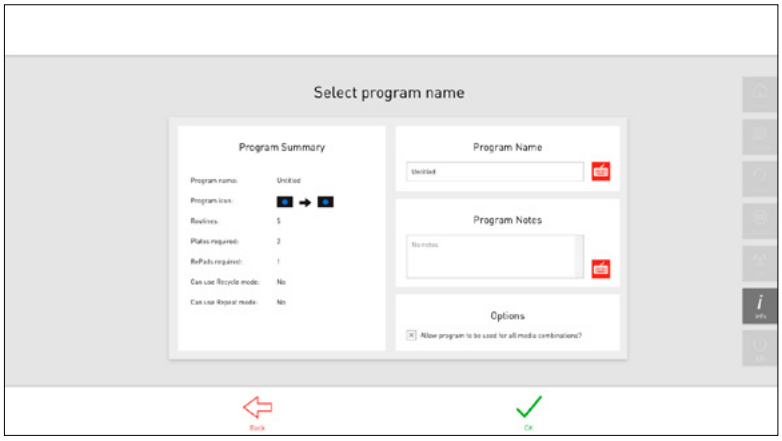
18

· Here you can name your program and add any notes.

· Click **OK** to save your program.

· And that's it! You can now run this program by clicking **Run Stored Program** on the home screen.

NOTE: Your program will only be visible if your source, target and RePads match the criteria you selected when creating the program.

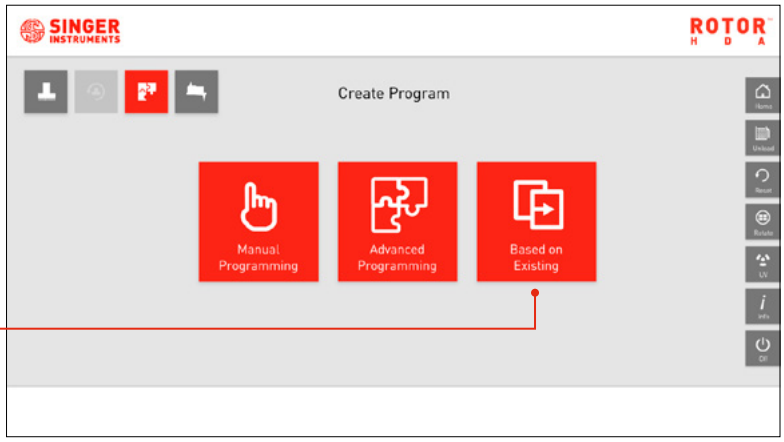


BASED ON EXISTING

1

· If you want to use an existing routine as a starting point then you can use the Based on Existing option.

· Select **Based on Existing**.



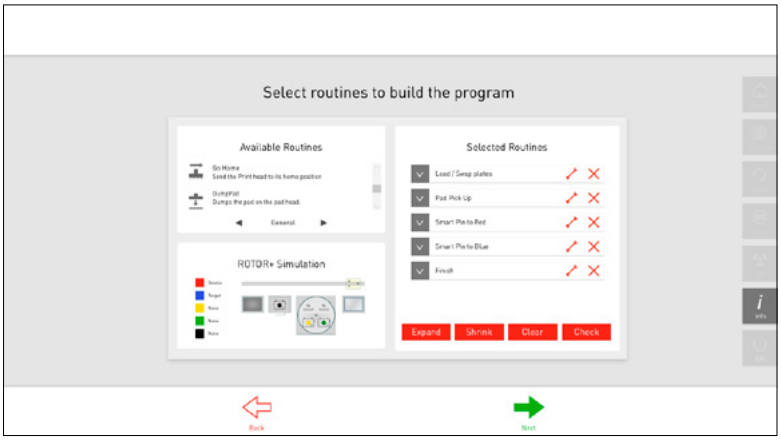
2

· Select the program you want to use as a base.

3

· This will load the program and break it down into it's individual routines. Here you can add, remove or edit the routines in the program.

Click **Next** to create an icon and name the updated program, following the steps 17-18 on page 27.

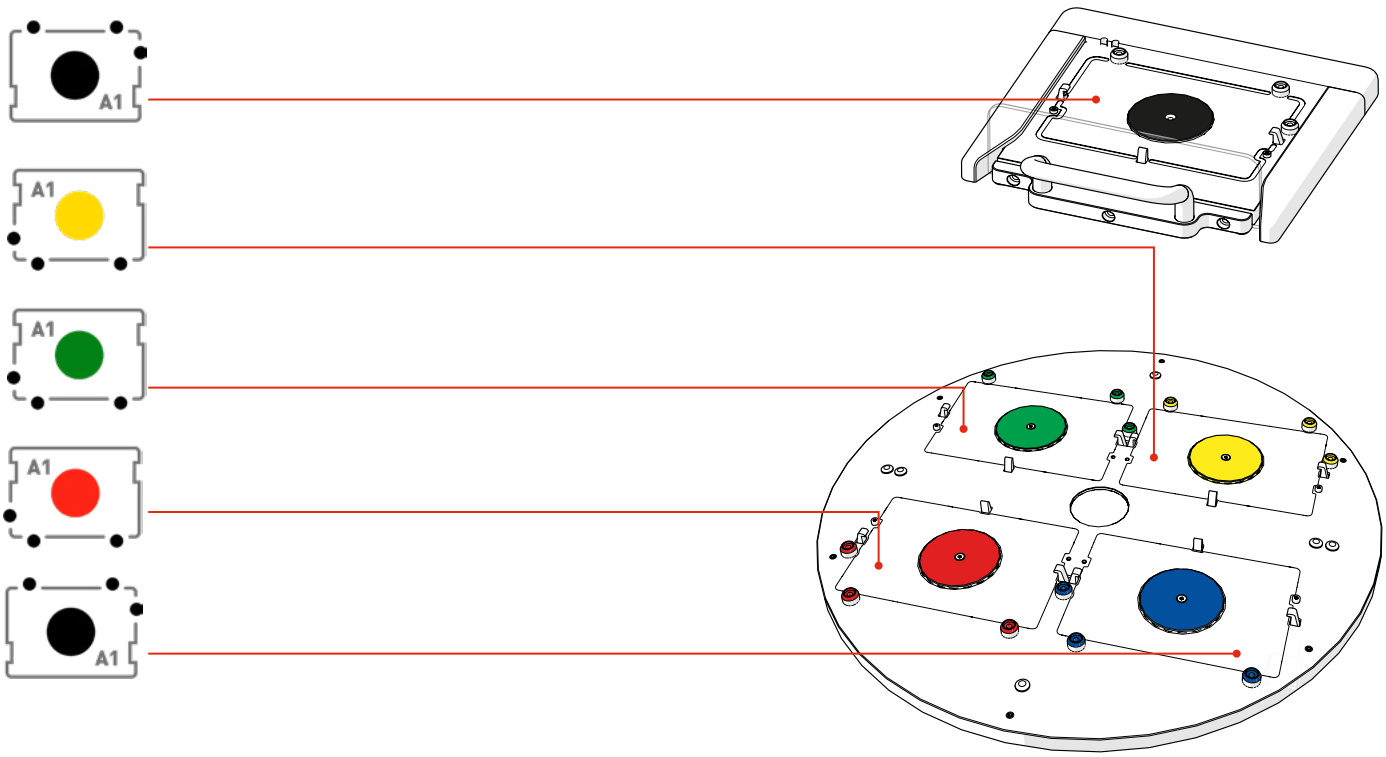


SOFTWARE ICON GUIDE

HOME SCREEN

- **Home:** This will return you to the ROTOR+ Home Screen.
- **Unload:** This allows you to remove the Hopper from the Home Screen.
- **Rotate:** This rotates the Turntable.
- **Reset:** This resets the ROTOR+.
- **UV:** This opens the UV Lamp Options.
- **Info:** This opens the ROTOR+ Help Panel. Here you can access the advanced options and online support.
- **Off:** Press to turn off the ROTOR+.

LOADING PLATES

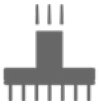


- Load Plate
- Source Plate
- Swap Plates
- Target Plates
- Remove Plate

PROGRAM OPTIONS

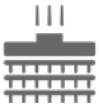
ICON	NAME	SETTING	DESCRIPTION	TAB	UNIT	MIN	MAX	DEFAULT
	Recycle	Off	RePads™/pins are always dumped.	General>Recycle	N/A	N/A	N/A	N/A
	Recycle	Full	RePads™/pins are recycled for the duration of the program.	General>Recycle	N/A	N/A	N/A	N/A
	Recycle	Until Repeat	RePads™/pins are recycled for the duration of one cycle of the program.	General>Recycle	N/A	N/A	N/A	N/A
	Recycle	During Pairs	RePads™/pins are recycled for the duration of each pinning pair.	General>Recycle	N/A	N/A	N/A	N/A
	Revisit Source	On/Off	Revisit ensures that the source is revisited for each pinning. If Revisit Source if off, the source plate will not be revisited unless a new position on the source plate is being pinned.	General>Recycle	Boolean	Off	On	Off
	Plate Protection	On/Off	By protecting the source plates you can ensure that lids are only removed when it is vital to do so. This will increase the time it takes to run each program, but each source plate will be exposed for less time, and the print head will never move over a source plate without a lid on, unless it is pinning from it	General>Plate Protection	Boolean	Off	On	Off
	Repeat Pairs	On/Off	A pinning pair represents pinning from a source plate to a target plate. You can adjust how many times each of these pairs are repeated. During pair repetition, Recycle and Revisit mode rules will be followed as normal.	General>Pairs	Boolean	Off	On	Off
	Offset	Off	No offset is used for source pinning.	Source>Offset	Boolean	Off	On	Off
	Offset	Automatic	An automatic offset is used for each source pinning.	Source>Offset	Boolean	Off	On	Off
	Offset	Random	A random offset is used for each source pinning.	Source>Offset	Boolean	Off	On	Off

SOFTWARE ICON GUIDE

ICON	NAME	SETTING	DESCRIPTION	TAB	UNIT	MIN	MAX	DEFAULT
	Offset	Manual	Select a manual offset before each source pinning.	Source>Offset	Boolean	Off	On	Off
	Offset	Fixed	A pre-specified fixed offset is used for selected source pins.	Source>Offset	Boolean	Off	On	Off
	Source Pinning Pressure		The pressure that the Pad Head will use to push onto the agar.	Source>Pinning	%	0	100	Varies for each pad
	Source Pinning Speed	Agar	The speed that the Pad Head will use to connect to the agar surface.	Source>Pinning	mm/s	1	20	19
	Source Pinning Overshoot	Agar	The amount of travel that will be applied after detecting agar contact. This is to enable operation of the pressure cylinder.	Source>Pinning	mm	Speed dependant	Speed dependant	2
	Repeat Source Pinning	Agar	The number of times each source pinning will repeat.	Source>Pinning	Integer	1	10	1
	Source Pinning Speed	Liquid	The speed applied to pinning to wet source plates.	Source>Pinning	mm/s	1	19	19
	Source Pinning Backoff	Liquid	The retraction distance applied to the Pad Head after sensing the bottom of the plate.	Source>Pinning	mm	-0.5	3	0.5
	Repeat Source Pinning	Liquid	The number of times each source pinning will repeat.	Source>Pinning	Integer	1	10	1
	Dry Mix Source	On/Off	Skipping around on the agar surface to select from a wider area of cells.	Source>Dry Mix	Boolean	Off	On	Off
	Dry Mix Clearance		The distance the pins retract from the agar surface.	Source>Dry Mix	mm	0	4	0.5
	Dry Mix Diameter		The diameter of the mix.	Source>Dry Mix	mm	0.1	2	1
	Dry Mix Cycles		The number of cycles (comprising of 5 steps) that the dry mix on source plates will be executed.	Source>Dry Mix	Integer	1	10	1

ICON	NAME	SETTING	DESCRIPTION	TAB	UNIT	MIN	MAX	DEFAULT
	Wet Mix Source	On/Off	Liquid mixing can be used to invigorate the cells in a liquid solution. Liquid mixing uses either a circular or helical movement.	Source>Wet Mix	Boolean	Off	On	Off
	Source Mixing Diameter		The diameter of the mix applied to both the x and y axis.	Source>Wet Mix	mm	1	3	1
	Source Mixing Speed		The speed at which wet mixes are carried out.	Source>Wet Mix	mm/s	1	25	25
	Source Mixing Cycles		The number of cycles the mix will include.	Source>Wet Mix	Integer	1	10	1
	Source Mixing Travel		The distance that the Pad Head retracts on 3D mixes.	Source>Wet Mix	mm	0.25	15	3
	Permanent offset		A permanent offset can be specified to reset the nominal centre for each source pinning. This feature is useful when pinning from source plates that have been printed to a non-central location.	Source>Permanent Offset	Point	-3,-3	3,3	0,0
	Target Pinning Pressure		The pressure that the Pad Head will use to push onto the agar.	Target>Pinning	%	0	100	Varies for each pad
	Target Pinning Speed	Agar	The speed that the Pad Head will use to connect to the agar surface.	Target>Pinning	mm/s	1	20	19
	Target Pinning Overshoot	Agar	The amount of travel that will be applied after connection to the agar surface has been made.	Target>Pinning	mm	Speed dependant	Speed dependant	2
	Repeat Target Pinning	Agar	The number of times each target pinning will repeat.	Target>Pinning	Integer	1	10	1
	Target Pinning Speed	Liquid	The speed applied to pinning to wet source plates.	Target >Pinning	mm/s	1	19	19
	Target Pinning Backoff	Liquid	The retraction distance applied to the Pad Head after connection to the bottom of the plate.	Target >Pinning	mm	-0.5	3	0.5

SOFTWARE ICON GUIDE

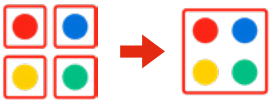
ICON	NAME	SETTING	DESCRIPTION	TAB	UNIT	MIN	MAX	DEFAULT
	Repeat Target Pinning	Liquid	The number of times each target pinning will repeat.	Target >Pinning	Integer	1	10	1
	Dry Mix Target	On/Off	Agar mixing can be used to ensure that a good contact with the target media is established. Agar mixing prints multiple times at a specified radius around the target spot on the agar after the initial central print has been established.	Target >Dry Mix	Boolean	Off	On	Off
	Target Mixing Clearance	Agar	The distance the Pad Head retracts from the agar surface at each stage of the mix.	Target >Dry Mix	mm	0	4	0.5
	Target Mixing Diameter	Agar	The diameter of the mix. Using step-in reduces the diameter from the specified diameter uniformly with each cycle for a thorough mix.	Target >Dry Mix	mm	0.1	2	1
	Target Mixing Cycles	Agar	The number of cycles (comprising of 5 steps) that the dry mix on source plates will be executed.	Target >Dry Mix	Integer	1	10	1
	Wet Mix Target	On/Off	Liquid mixing can be used to ensure thorough depositing of cells in the liquid solution. Liquid mixing uses either a circular or helical movement.	Target >Wet Mix	Boolean	Off	On	Off
	Target Mixing Diameter	Liquid	The diameter of the mix applied to both the x and y axis. Using step-in reduces the diameter from the specified diameter uniformly with each cycle for a thorough mix.	Target >Wet Mix	mm	1	3	1
	Target Mixing Speed	Liquid	The speed at which wet mixes are carried out.	Target >Wet Mix	mm/s	1	25	25
	Target Mixing Cycles	Liquid	The number of cycles the mix will include.	Target >Wet Mix	Times	1	10	1
	Target Mixing Travel	Liquid	The distance that the Pad Head retracts on 3D mixes.	Target >Wet Mix	mm	0.25	15	3
	Pad Pickup Pressure		The pressure applied by the Pad Head when picking up pads.	Pads	%	0	100	80

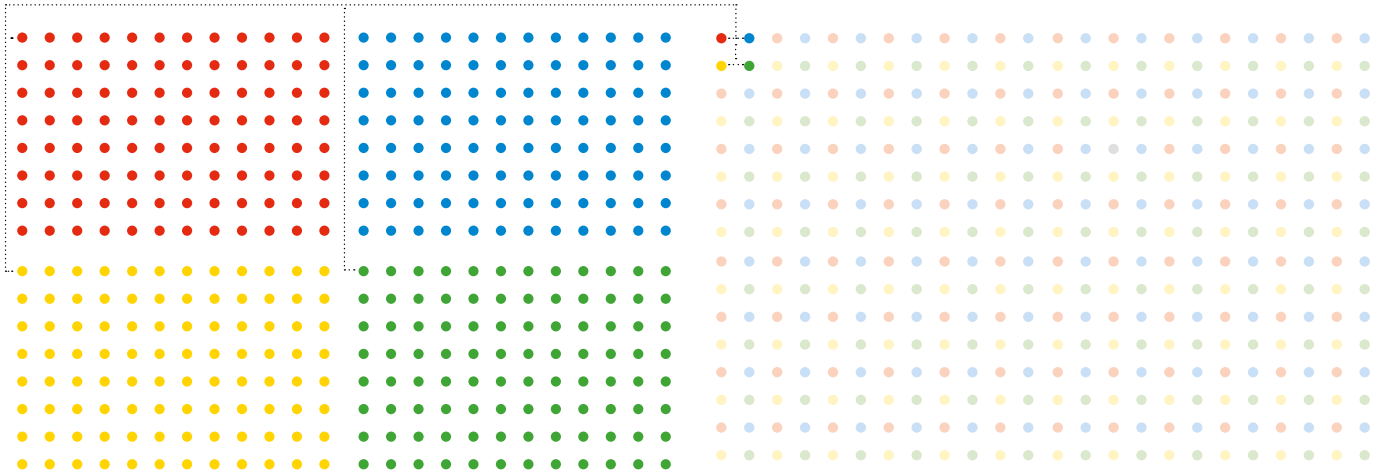
PINNING EXAMPLES

1

1:4 ARRAY

· 4x 96-density plates are combined onto 1x 384-density plate.

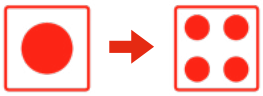


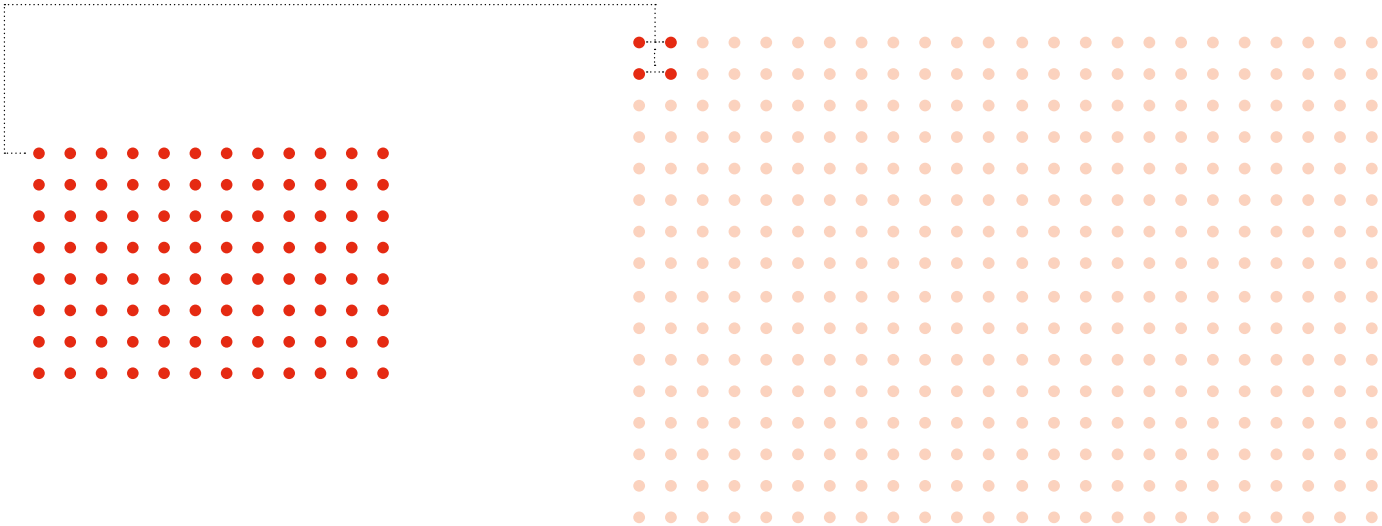


2

1:4 SINGLE SOURCE

· Each colony from a 1x 96-density plate replicated in quadruplicate to a 1x 384- density plate. These protocols can be applied at all pinning densities.

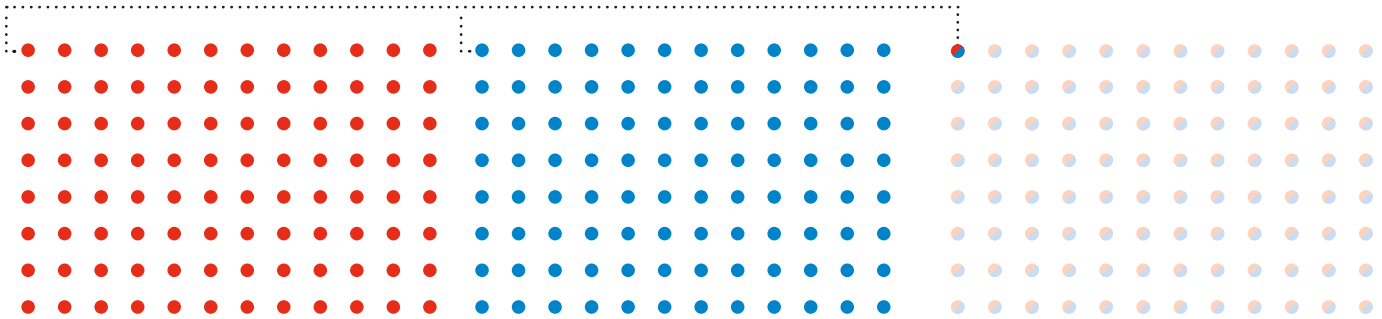




3

MATE

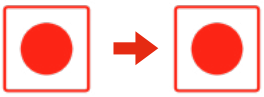
· 2x 96-density plates are mated onto 1x 96-density plate.

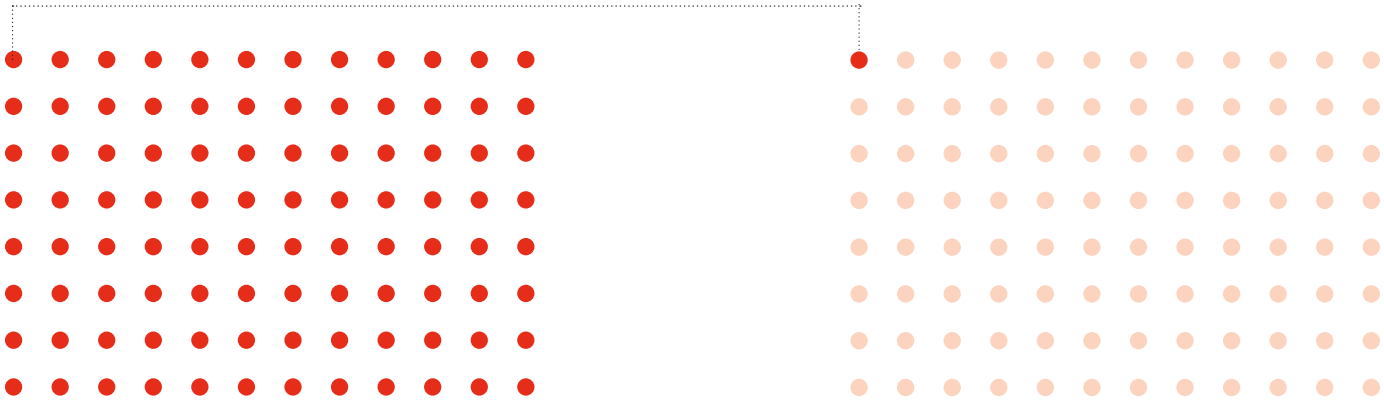


4

REPLICATE

· 1x 96-density plate is replicated onto 1x 96-density plate.

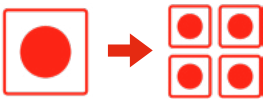


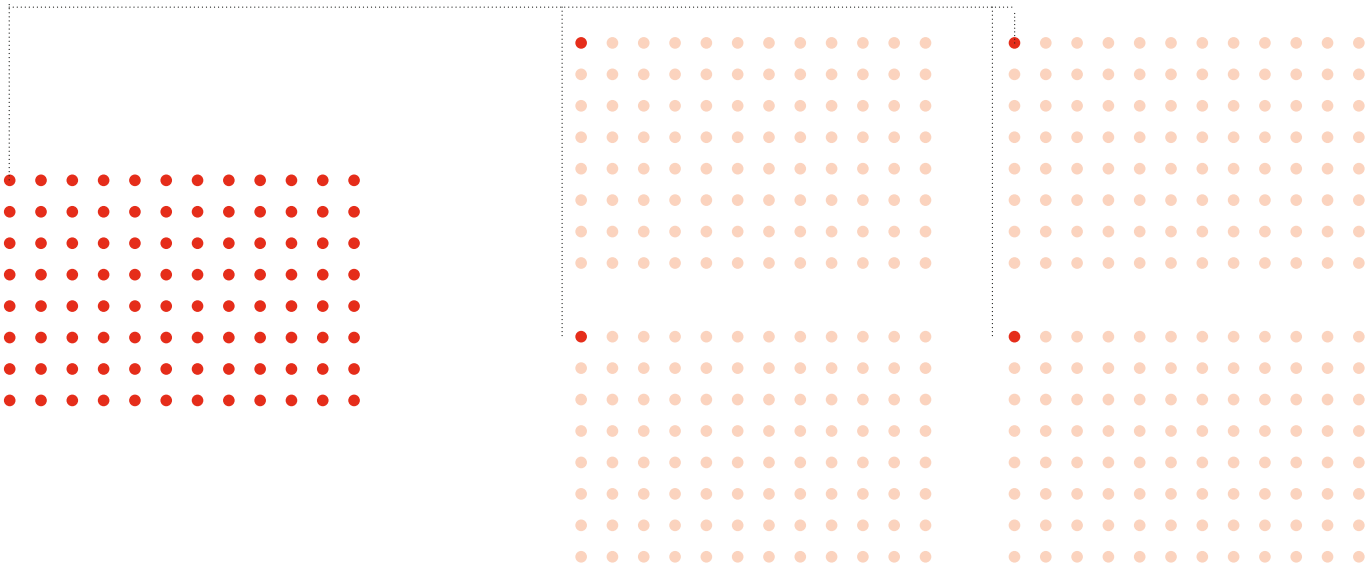


5

REPLICATE MANY

· 1x 96-density plate is replicated onto 4x 96-density plates.





TECHNICAL SPECIFICATIONS

DIMENSIONS

- Length: 1300mm *(51")*
- Width: 650mm *(26")*
- Height *(from bench top)*: 725mm *(29")*

NOTE: An additional 500mm *(20")* is needed at one end for the bracket mounted MCI. This can fit at either end. The working height of the ROTOR+ turntable is 300mm *(12")* from the benchtop.

NOTE: For servicing, the ROTOR+ will require reasonable free space all round.

WEIGHT

- 110kg *(242 lbs)*

NO-COST ACCESSORIES:

- Bottle cap remover or Corkscrew *(specify)*.

POWER REQUIREMENTS

- 110-240V AC 50-60Hz Power: 500W
- Power connection at Right Hand End *(from front)* via IEC Cable *(supplied)*.

COMPRESSED AIR REQUIREMENT

(FOR COMPRESSOR, SEE PAGE 23)

- Dry, oil-free, compressed air/nitrogen at min 4 bar *(60 psi)* max 10 bar *(150psi)*
- Consumption: 3 l/min *(0.1 CFM)*
- Air connects to LH end *(from front)* see *Compressor Section* for connection details.

HEAD

- Movement: X: 800mm
  Y: 30mm
  Z:90mm
- Clearance above turntable: 85mm
- Resolution: X: 50µ
  Y & Z: 5µ
- Speed: X: up to 1600mm/sec,
  Y & Z: 25mm/sec *(selectable)*
- Control: X axis is closed-loop, linear motor with linear encoder.
  Y & Z are open-loop stepper motor drives with optical data setting.

PAD HEAD

- Vacuum-operated and fully floating to comply with agar surface.
- Programmable, variable pressure.

PAD DISPENSER

- Holds max 4 long-pin RePads™ and max 30 other types.
- Dispenser automatically counts RePads™ and flags up shortage on GUI.
- Pad Dispenser rim fingers ensure accurate and repeatable RePad™ positioning.

TURNTABLE

- Diameter: 360mm
- Angle of rotation: 180°
- Time: 2.5sec
- Repeatability better than 10µ
- Fitted with fully automatic plate positioners and latches.
- Bays are colour coded.

LID REMOVERS

- Triple, pneumatic, lift-and-turn lid removers each with double hold-and-lift, vacuum-operated suction cups.
- Arms fitted with anti-rebound dampers.

FUNCTIONALITY

- Suspension transfer *(wet/wet)*
- Spotting *(wet/dry)*
- Colony replicating *(dry/dry)*
- Array generation
- Mating
- Inoculation *(dry/wet)*
- Deep well plate inoculation *(dry/deep well plate)*

DENSITIES OF MEDIA SUPPORTED

- 96, 384, 1536 and 6144 RePads™ *(solid agar)*
- Long-pin 96 and 384 RePads™ *(liquid/liquid-liquid/solid - solid/liquid)*

PLATE

- 96 and 384-well footprint, standard depth
- Singer PlusPlates™ *(Rectangular, single extended cavity, 96-well footprint)*

MACHINE CONTROL INTERFACE

- 15" touchscreen 1224 x 788 resolution
- Intel Atom Processor
- 1GB RAM
- 1.8GHz
- 10GB hard drive
- Windows XP embedded standard

SOFTWARE

- Commands include automatic and manual offset pinning to ensure even repeat cell pick up from colonies and automatic stirring mode for re-suspention in microtitre wells.
  Remote access and diagnostics and other protocols are under continuous development.

LIGHTING/DISINFECTION

- White
- UVc

COMPRESSOR

- Compressor type may vary, please consult your Singer Technician.

- Our standard compressor is very quiet and performs optimally standing on the floor. It has a reservoir inside it and will run only intermittently. The pipe connecting the compressor to the ROTOR+ is **6mm dia** *(1/4")*. The compressor may be sited away from the ROTOR+ *(please let us know about this so that we can supply a long enough pipe)*.

- **120V** or **230V** versions of our standard compressor are available.
- Power: **500W**.

AIR/GAS CONNECTION

Where we do not supply a compressor, the ROTOR+ is supplied with a male quick-change coupler. We will supply, in advance, the female mating part to this, so that you can arrange connection before installation.

PERFORMANCE

The ROTOR+ is manually loaded and unloaded, but very special attention has been paid to speed of replication. The turntable, which conveys plates in and out of the sealed operating zone of the ROTOR+, may be unloaded and loaded whilst replication is in progress. This makes the process very continuous.

Performance tests carried out for Singer by a major yeast laboratory claim replication rates in excess of 100 PlusPlates™ per hour.

At the supported densities, this equates to:

- 96: **9,600 colonies**
- 384: **38,400 colonies**
- 768: **76,800 colonies**
- 1536: **153,600 colonies**
- 6144: **614,400 colonies**

CONSUMABLES

- Singer PlusPlates™: Standard footprint, single well plate with specially extended working area for RePad™ compatibility and meniscus allowance.
- RePads™: **96 Long**
  384 Long
  96 Short
  384 Short
  1536 Short
  6144 Short

All consumables are made of plastic and are gamma irradiated and double packed.

Pack sizes:

- PlusPlates™: **10 per sleeve/ 200 per box**
- Long 96: **10 per sleeve/ 200 per box**
- Long 384: **10 per sleeve/ 200 per box**
- Short 96: **20 per sleeve/ 1000 per box**
- Short 384: **20 per sleeve/ 1000 per box**
- Short 1536: **20 per sleeve/1000 per box**
- Short 6411: **20 per sleeve/1000 per box**

SAFETY AND COMPLIANCE

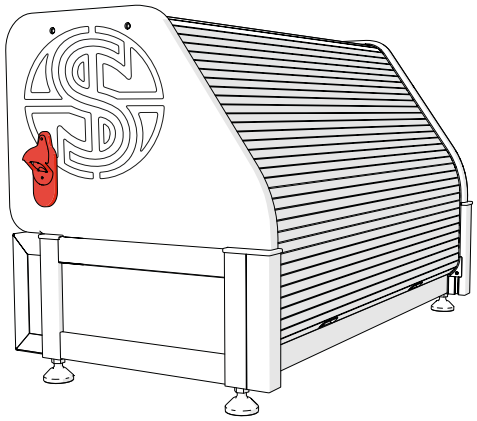
- Safety Interlocks on vision panel and rear control panel.
- UV lamp operation is under software control and is interlocked with main, roller cover closure.
- CE compliance by technical file.

POST-EXPERIMENTAL PROCEDURE

1

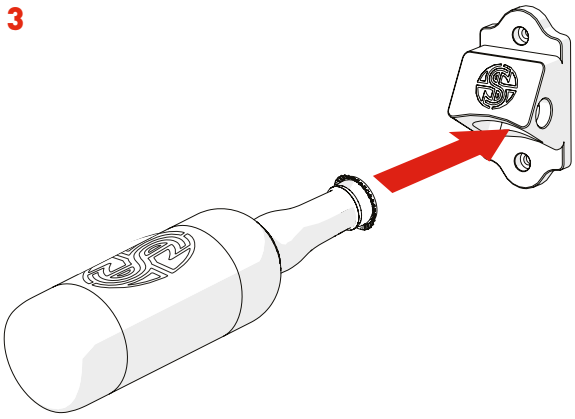
· Select a **Delicious Beverage.**

2



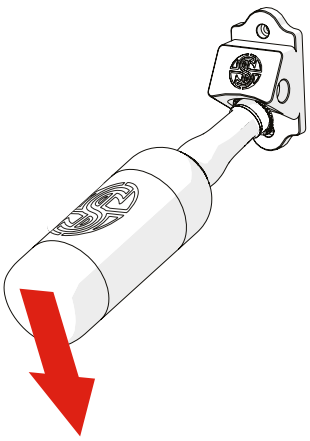
· Locate the Bottle Opener on your ROTOR+.

3



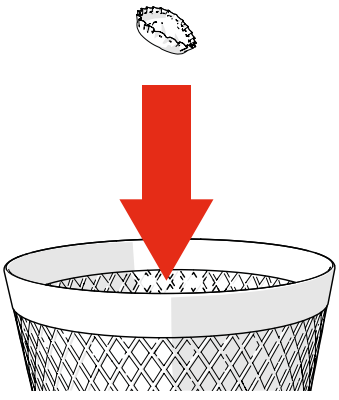
· Insert the Bottle into the Bottle Opener.

4



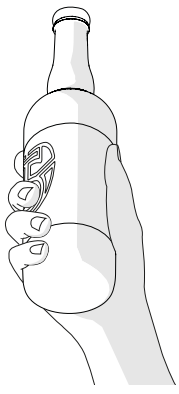
· Lever the Bottle to remove the Bottle Cap

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.

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!

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DISCLAIMER

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