

PICKING



**SINGER
INSTRUMENTS**
A RESPONSIBILITY TO SCIENCE!

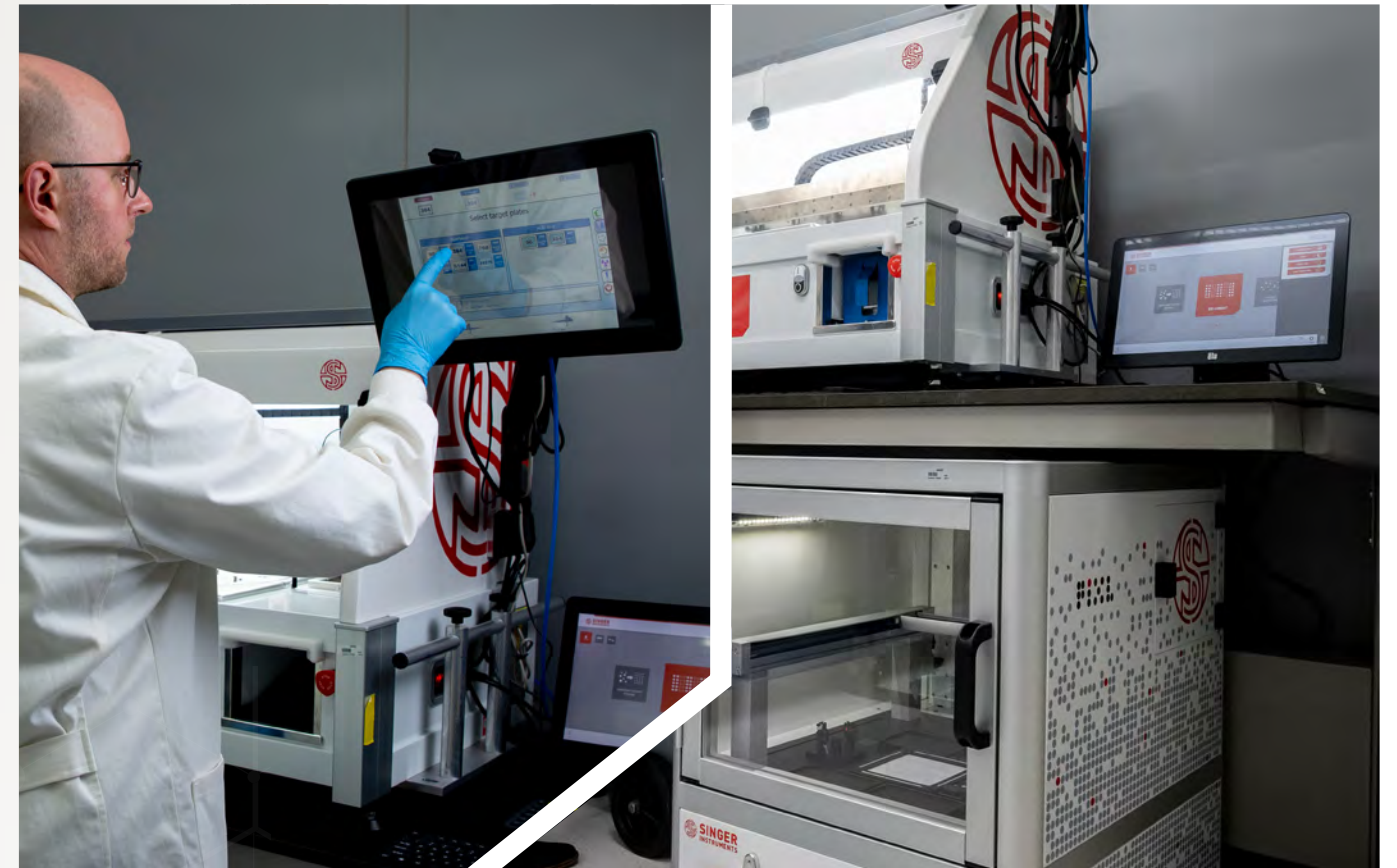
ROTOR+



SCREENING

*A RESPONSIBILITY
TO SCIENCE*

There is no more
high-throughput
and precise way to
complete a **microbial**
screen, period.



HIGH-THROUGHPUT SCREENING OF CHLAMYDOMONAS REINHARDTII TRANSFORMANTS

*"I CAN'T SPEAK HIGHLY ENOUGH ABOUT THESE TWO
INSTRUMENTS. WE HAVE HAD THEM UP AND RUNNING FOR
6 MONTHS IN OUR LAB, AND TOGETHER, THEY HAVE BEEN
A GAME-CHANGER IN TERMS OF THROUGHPUT
AND REPRODUCIBILITY"*

Kyle Lauersen

King Abdullah University of Science
and Technology - Saudi Arabia

[READ THE FULL STORY](#)

**PICK AND SCREEN NEARLY
ONE MILLION COLONIES PER HOUR.
USING COLONY SIZE AS AN ACCURATE
PROXY FOR COLONY FITNESS.¹**

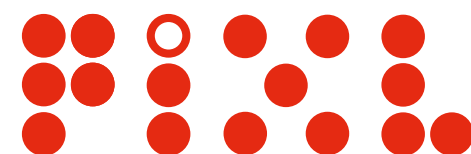
16 - 300X** INCREASE
IN THROUGHPUT VS.
YOUR CURRENT SCREENING METHOD.*

*Example comparison based on screening
6,144 samples with a 384 channel liquid handler.

**Example comparison based on screening
6,144 samples with an 8-channel pipette.

1. Baryshnikova, A., Costanzo, M., Kim, Y., Ding, H., Koh, J., Toufighi, K., Youn, J. Y., Ou, J., San Luis, B. J., Bandyopadhyay, S., Hibbs, M., Hess, D., Gingras, A. C., Bader, G. D., Troyanskaya, O. G., Brown, G. W., Andrews, B., Boone, C., & Myers, C. L. (2010). Quantitative analysis of fitness and genetic interactions in yeast on a genome scale. *Nature methods*, 7(12), 1017–1024.
<https://doi.org/10.1038/nmeth.1534>

ROTOR+



HIGH-THROUGHPUT SCREENING

ROTOR+ is the fastest colony manipulation robot in the world with unbeatable accuracy; capable of pinning nearly a million colonies per hour.



High-density
Pinning



Replicate, Mate
Re-Array



2D and 3D
Mixing



Deepwell
Compatibility

*REPLICATE THE ENTIRE YEAST
DELETION LIBRARY IN LESS
THAN 25 SECONDS!*

PRECISION COLONY PICKING

PIXL is a reliable and easy-to-use microbial colony picker. It automates high-quality colony imaging, detection, selection and picking.



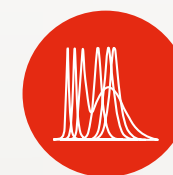
>99% Transfer
Rate



Streaking
Options



Agar
Piercing



Fluorescence
Detection

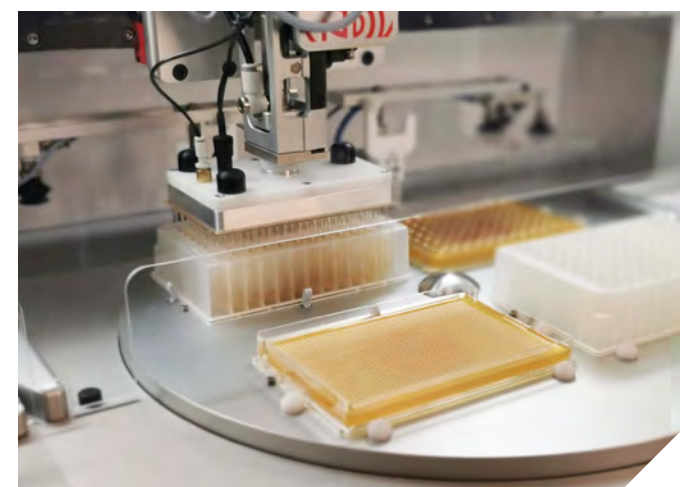
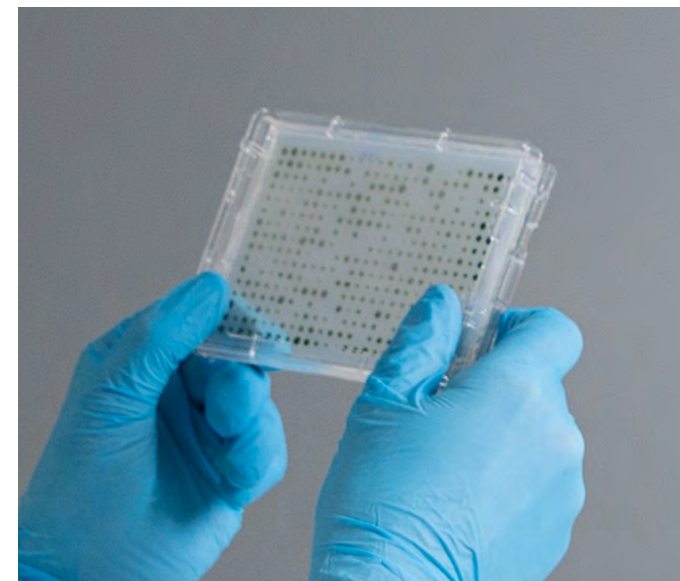
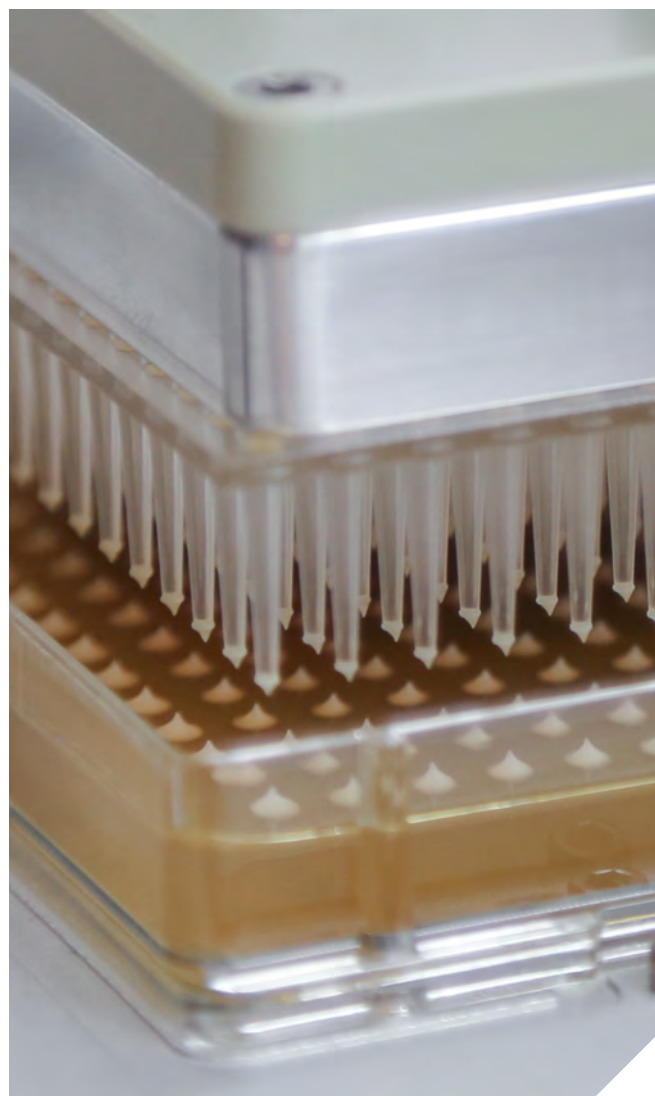
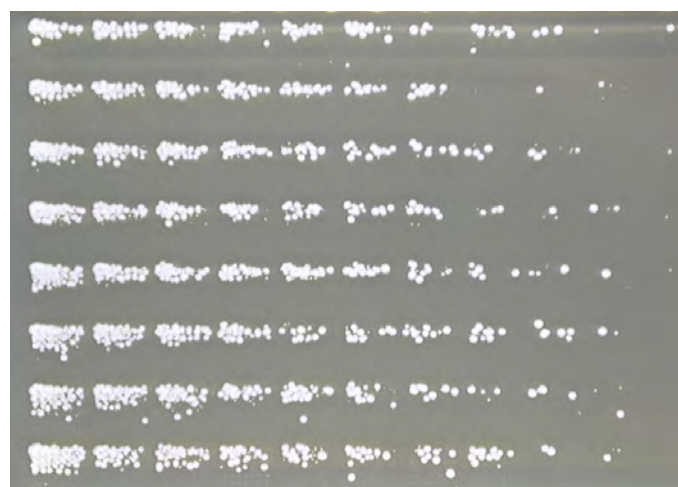
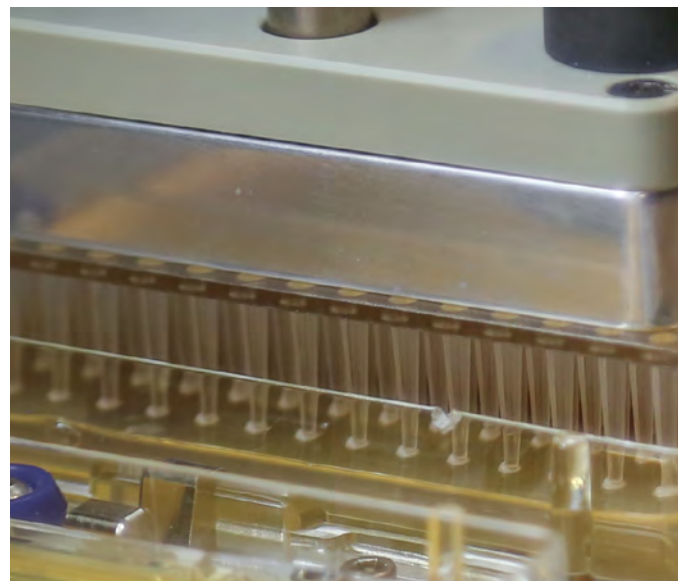
*90% OF THE FUNCTIONALITY
CAN BE LEARNT BY ANYBODY
IN AS LITTLE AS 10 MINUTES*

ROTOR+

*MORE THAN 10,000 CITATIONS SAYS ROTOR+
IS THE WORLD'S FAVOURITE MICROBIAL
ARRAYING ROBOT!*

Colony Screening

ROTOR+ is a compact benchtop robot for easy, ultra-fast manipulation of high-density arrays of yeast, fungi, bacteria and algae. ROTOR+ uses sterile polymer replica plating pads to support liquid pinning to and from 96 and 384-well microtiter plates and agar pinning at densities of 96, 384, 1536, and 6144.



STREAKING

The colony manipulating print head is able to streak or plate cells using a 7x7 matrix protocol onto an agar plate from liquid or agar sources at world-leading throughputs, enabling the isolation of single colonies. This protocol automates high-throughput plating of microbial organisms, allowing researchers to isolate colonies from 96 samples onto one target plate, in less than two minutes.



RE-ARRAYING AND MATING

Replicate, Mate, and re-array from single or multiple source plates at densities of 96, 384, 1536 and 6144. Multiple, low-density plates may be combined into fewer, high-density plates with ease.



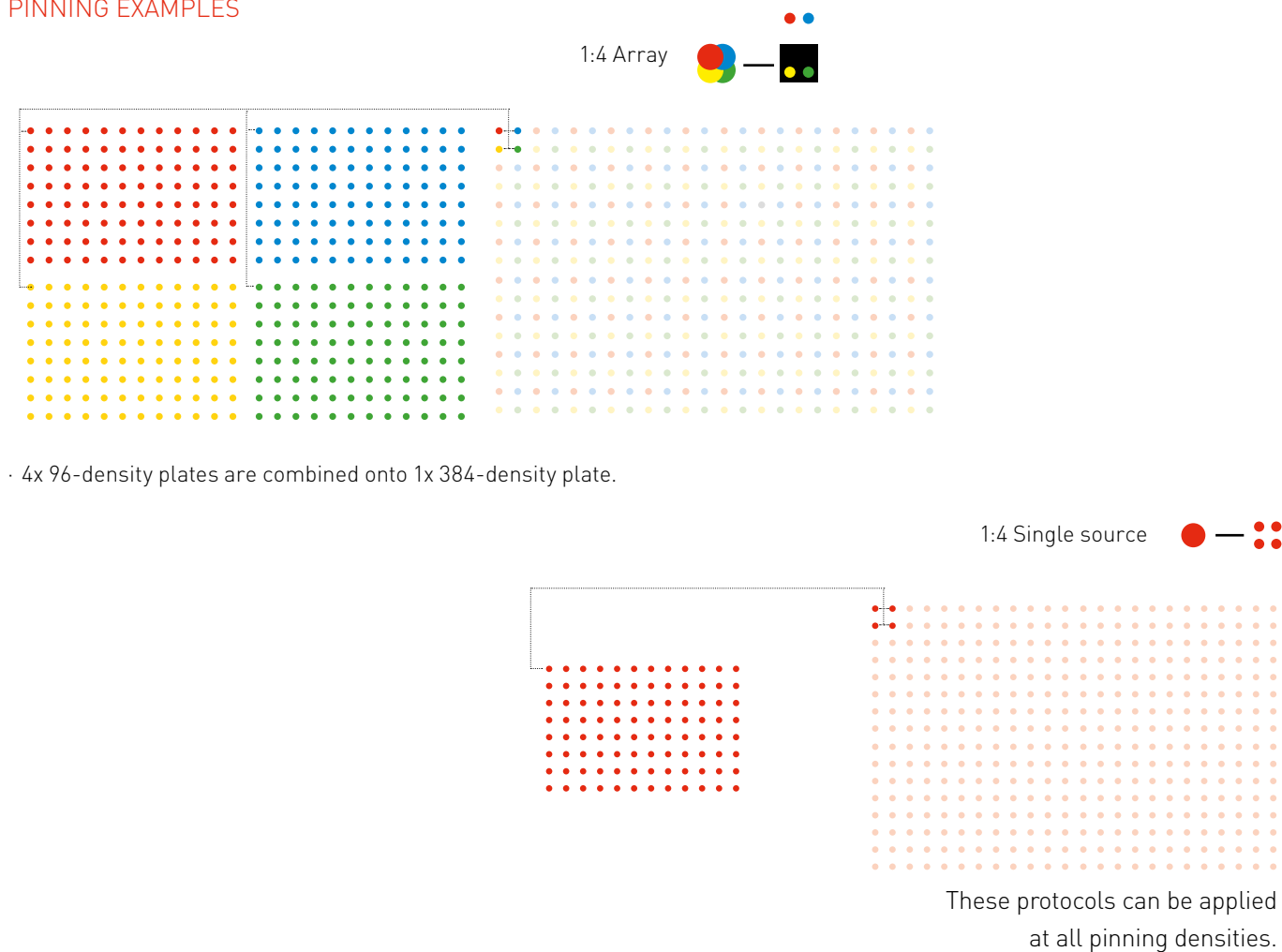
2D AND 3D MIXING

The wet mix function allows the colony manipulating print head to stir in a helical motion. This ensures that the cells are evenly and consistently transferred from and to a liquid culture. Dry mixing is achieved by the colony manipulating print head scraping the agar surface in a custom set diameter. This enables transfer rates >99% across a range of microorganisms.

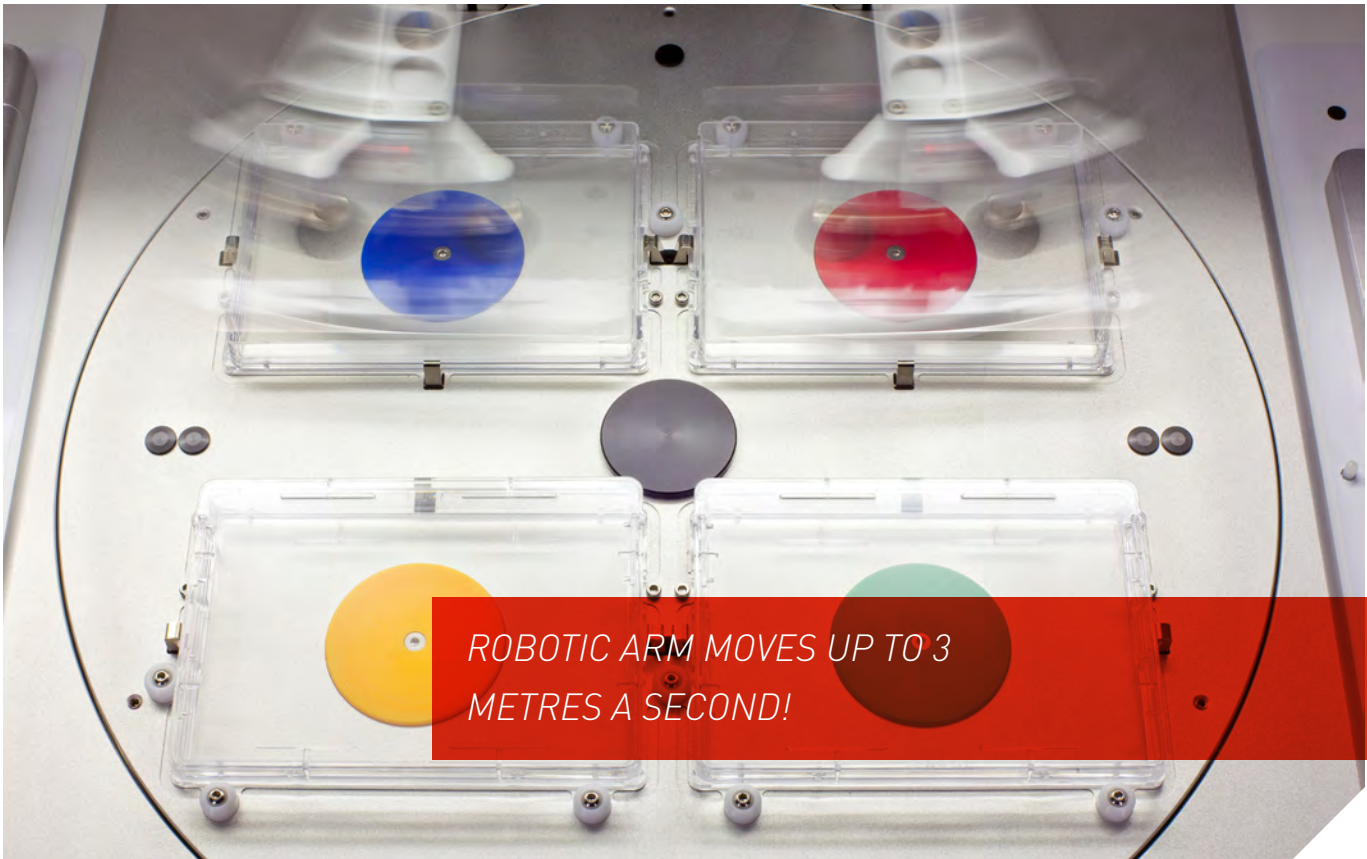
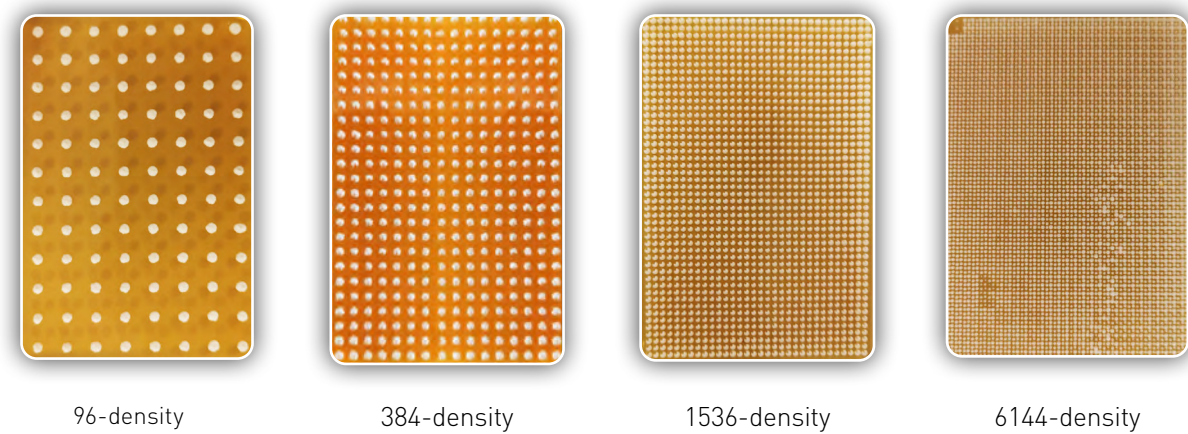
[BOOK A DEMO](#)

PINNING FEATURES

PINNING EXAMPLES



THE POWER OF ROTOR+ IS UNPARALLELED. IT TAKES <25 SECONDS TO REPLICATE THE ENTIRE YEAST GENOME!



AGAR TO AGAR PINNING SPEED IS 25 SECONDS PER PLATE.

LIQUID TO AGAR PINNING SPEED IS 28 SECONDS PER PLATE.

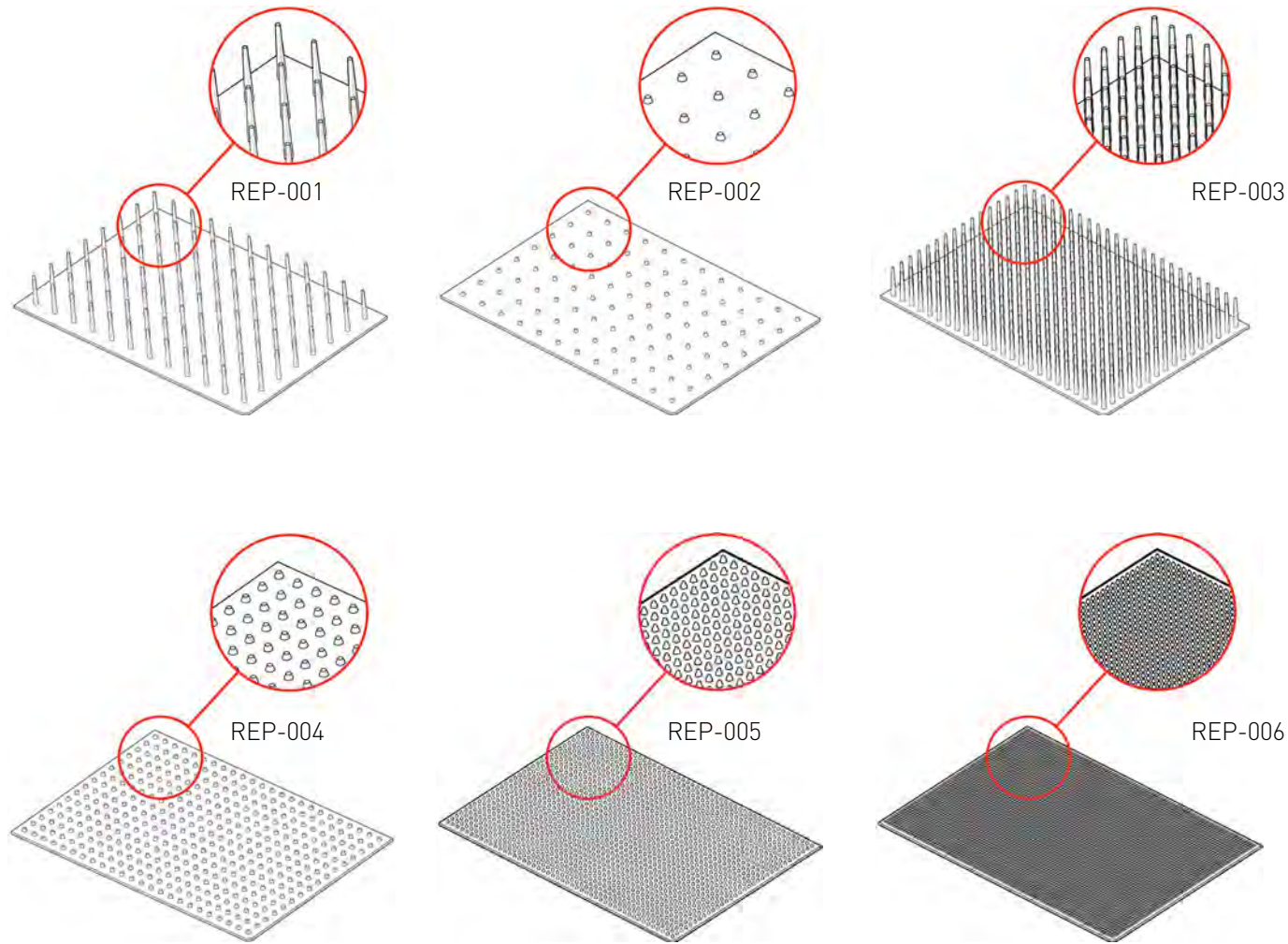
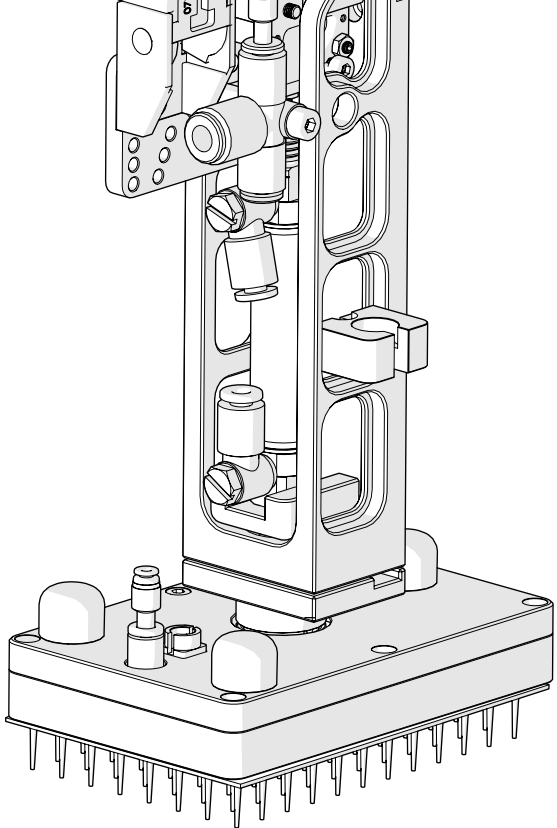
PLATES & PADS

ROTOR+ uses Singer RePads: high-quality plastic replica-plating pads to transfer colonies between plates. Singer RePads are available in two pin lengths: short for agar-to-agar colony transfer and long for transferring cells in liquid culture.

Our short-pin RePads come in a range of densities: 96, 384, 1536 and 6144. Our long-pin RePads are available in 96 and 384 format, allowing transfer from shallow and deep multi-well microtitre dishes.

Singer high-quality PlusPlates, with increased plating area, are essential for precise replication at all densities. Singer RePads and PlusPlates come in gamma-irradiated packs and in application-matched sleeves.

ROTOR+ will also accept multi-well, microtitre plates: Shallow and Deep Well Plates (96 and 384) and SBS standard trays, compatible with long-pin RePads.



ACCESSORIES & CONSUMABLES



SPARES, ACCESSORIES & REMOTE SUPPORT

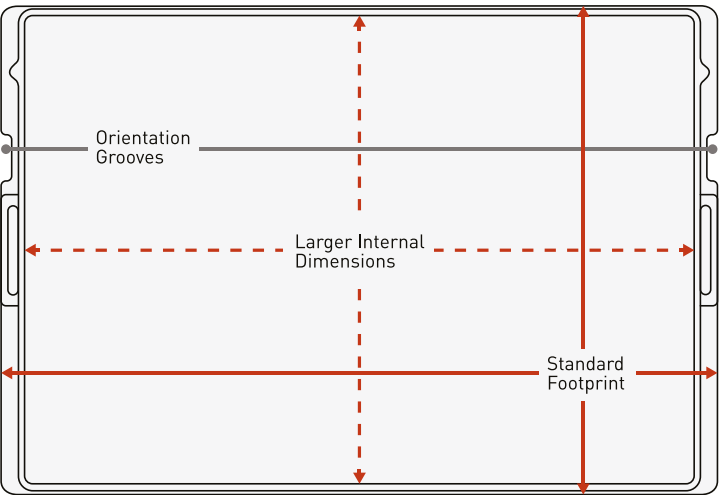
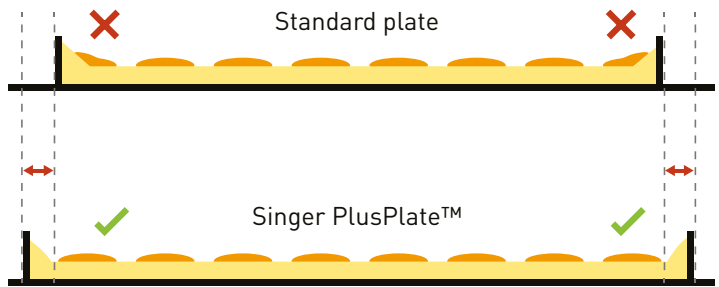
AIR COMPRESSOR
CMP-002

PAD HOPPER
HOP-002

DUMP DRAWER
DDR-002

PLUSPLATES

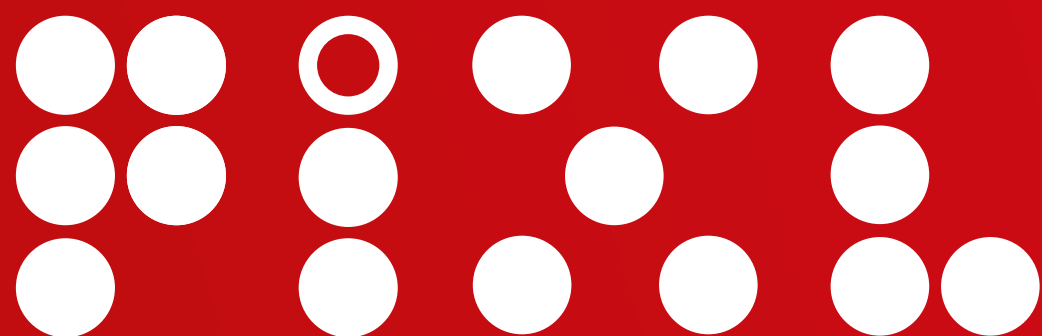
PLUSPLATES
PLU-003



REPADS

96 LONG REP-001	1536 SHORT REP-005
96 SHORT REP-002	6144 SHORT REP-006
384 LONG REP-003	VARI START PACK VSP-001 (96 long x40, 384 long x40, 96 short x200, 384 short x200, 1536 short x200)
384 SHORT REP-004	

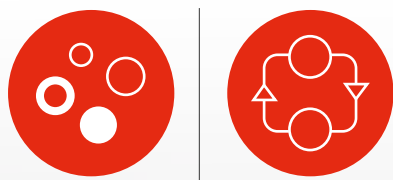
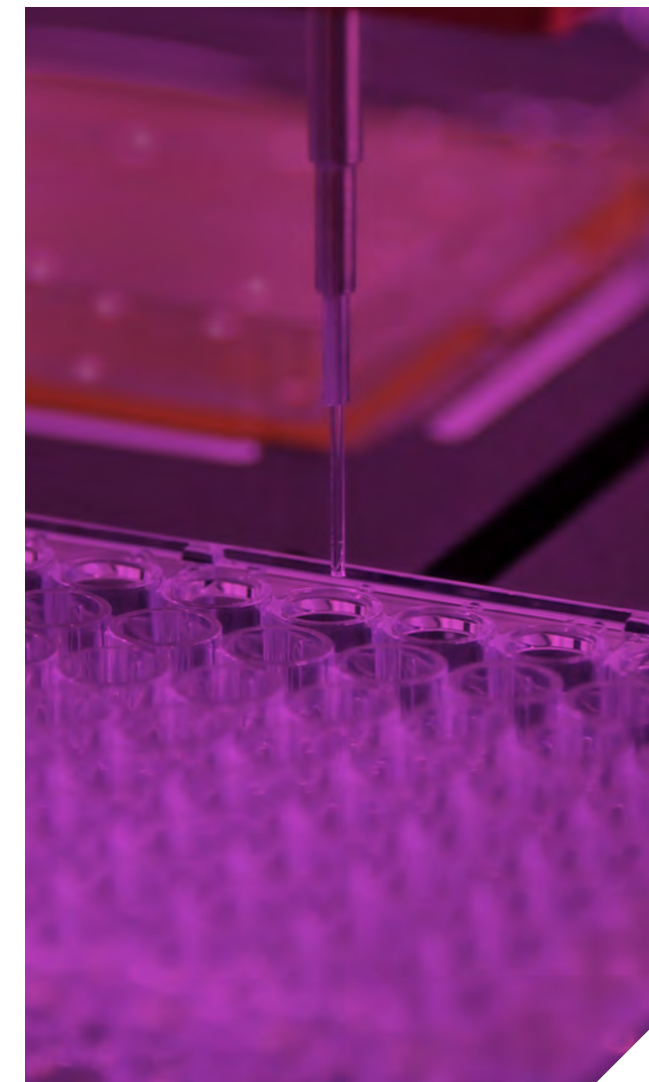
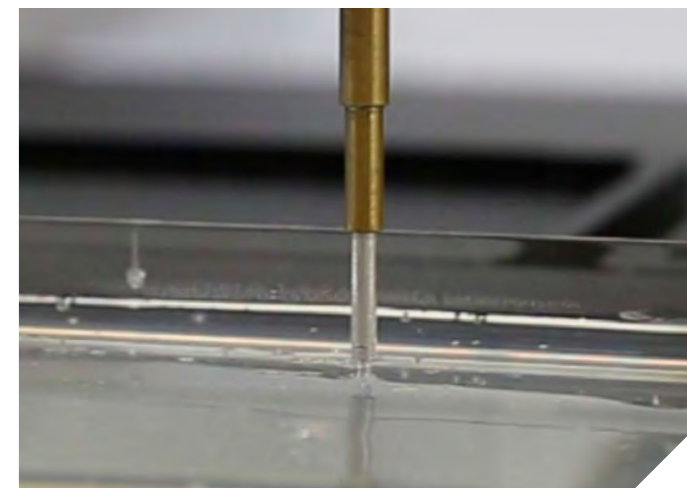
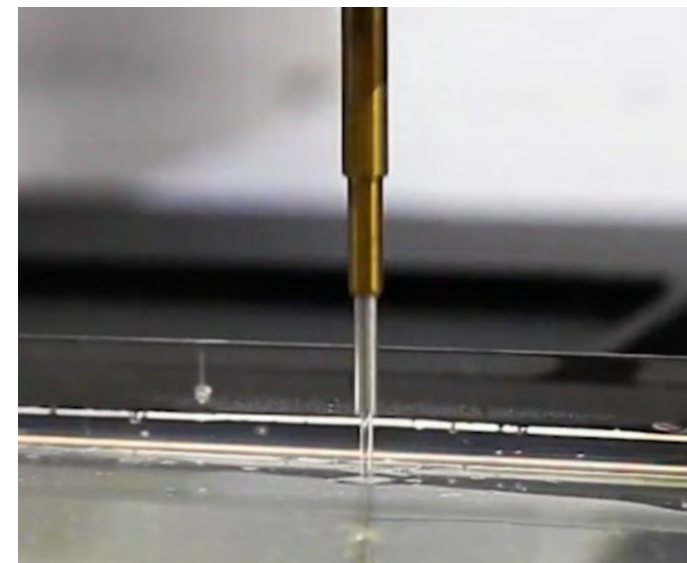
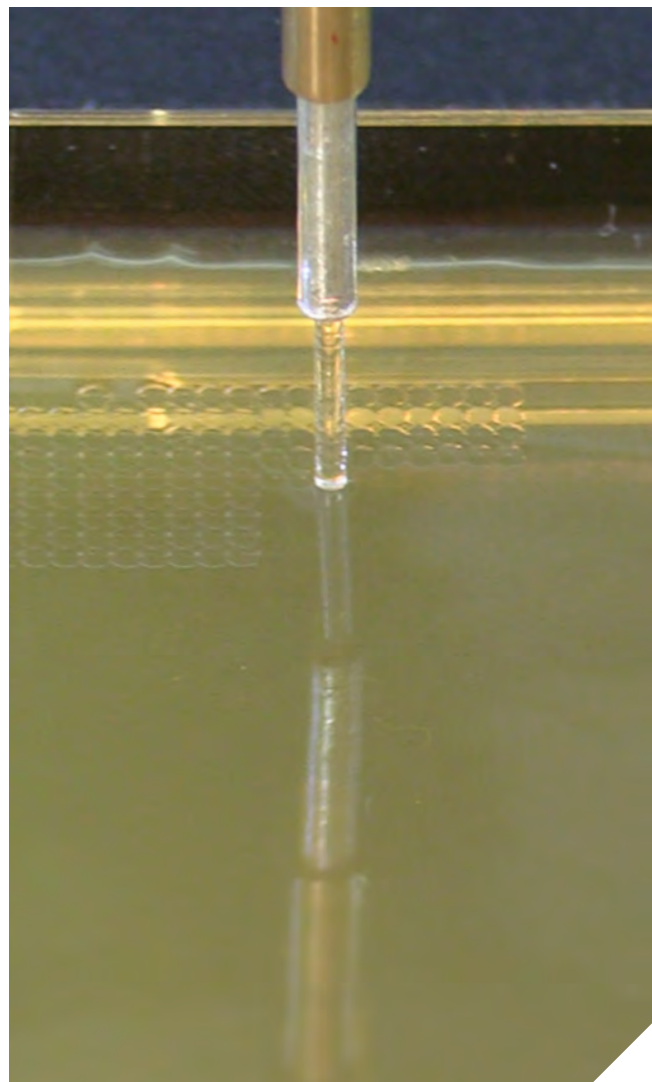
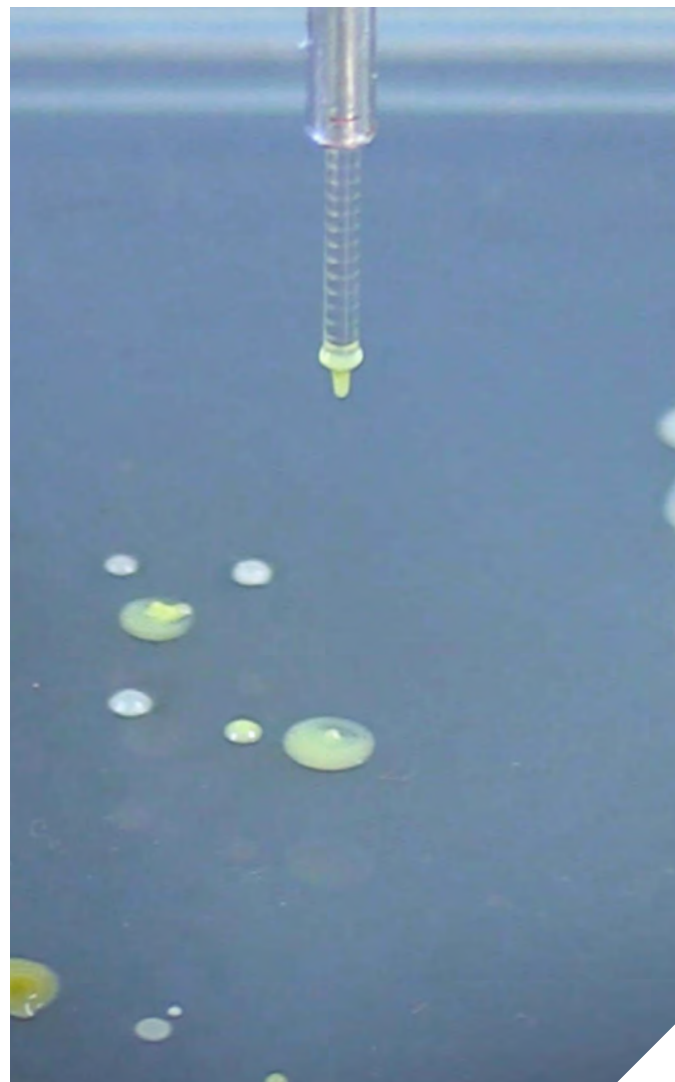




DEVELOPED WITH LEADING
SYNTHETIC BIOLOGY PARTNERS

Colony **Picking**

Pinpoint picking technology can cope with any variation in agar height, automatically. PIXL detects the surface and regulates the contact pressure for every pick. This ensures that every single colony on your plate is picked, without damaging, missing or splashing cells all over the place.



COLONY HIT PICKING

Cherry pick the hits that interest you from multiple source plates onto one target plate, or vice versa. With a transfer rate >99% and agar surface detection on every pick, PIXL will never miss your colonies.



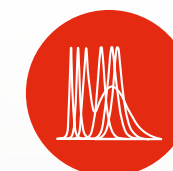
COLONY STREAKING

PIXL is able to streak or plate cells using a customisable protocol onto an agar plate, from liquid or agar sources, allowing the isolation of single colonies.



AGAR PIERCING

Pierce the agar to pick colonies or subsurface hyphae. Within the settings, agar piercing can optionally be applied to each of your source and target plates. Adjustable penetration depth ensures you only pick colonies or hyphae that you are interested in.



FLUORESCENCE DETECTION

Turn on its fluorescent LEDs, insert the appropriate bandpass filter and PIXL will quantify and allow selection for wtGFP, sfGFP, mCherry, tagBFP, Venus and many other fluorescent markers.

[BOOK A DEMO](#)

ACCESSORIES

PICKUPLINE

PUL-001

Load a single 200m reel into PIXL to form up to 33,000 sterile, disposable tips.

BLADE & ANVIL KIT

BAK-001

Repeatable and reliable. Specifically engineered for your PickupLine.

PIXL DUMP DRAWER

PDD-001

An additional dump drawer can increase workflow efficiency - continue working while a dump drawer is being autoclaved.

PETRI DISH ADAPTOR

90MM: PET-002 150MM: PET-003. 120MM

SQUARE: PET-005

Easily adapt your PIXL source bay to work with rectangular plates, square plates, 90mm or 150mm Petri dishes.

KINEMATIC NOZZLE

KIN-001

For those who are super-cautious, but want to maximise PIXL's uptime: send one nozzle for autoclaving and use this spare.

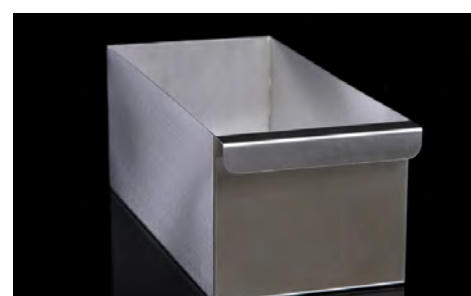
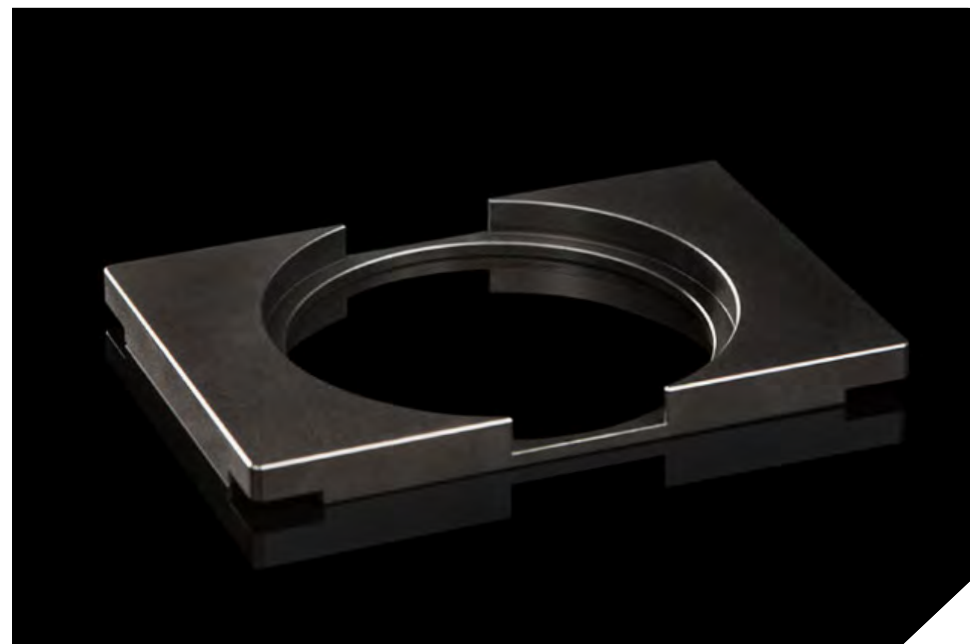
FLUORESCENCE FILTERS

452NM: PXF-001

510NM: PXF-002

527NM: PXF-003

615NM: PXF-004



PICKUPLINE

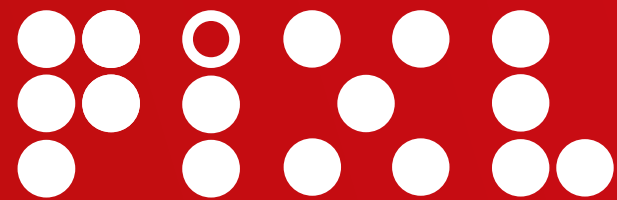
PickupLine is a 1mmØ bespoke polymer extrusion, available in sterile 200m reels.

Load a single reel into PIXL to form up to 33,000 sterile, disposable tips. Its cutting-characteristics allow PIXL's precision blade to produce a tip perfect for picking bacteria and fungal colonies.

- Select up to 33,000 colonies with each PickupLine
- Sterile
- Tips optimised for microbial colony picking

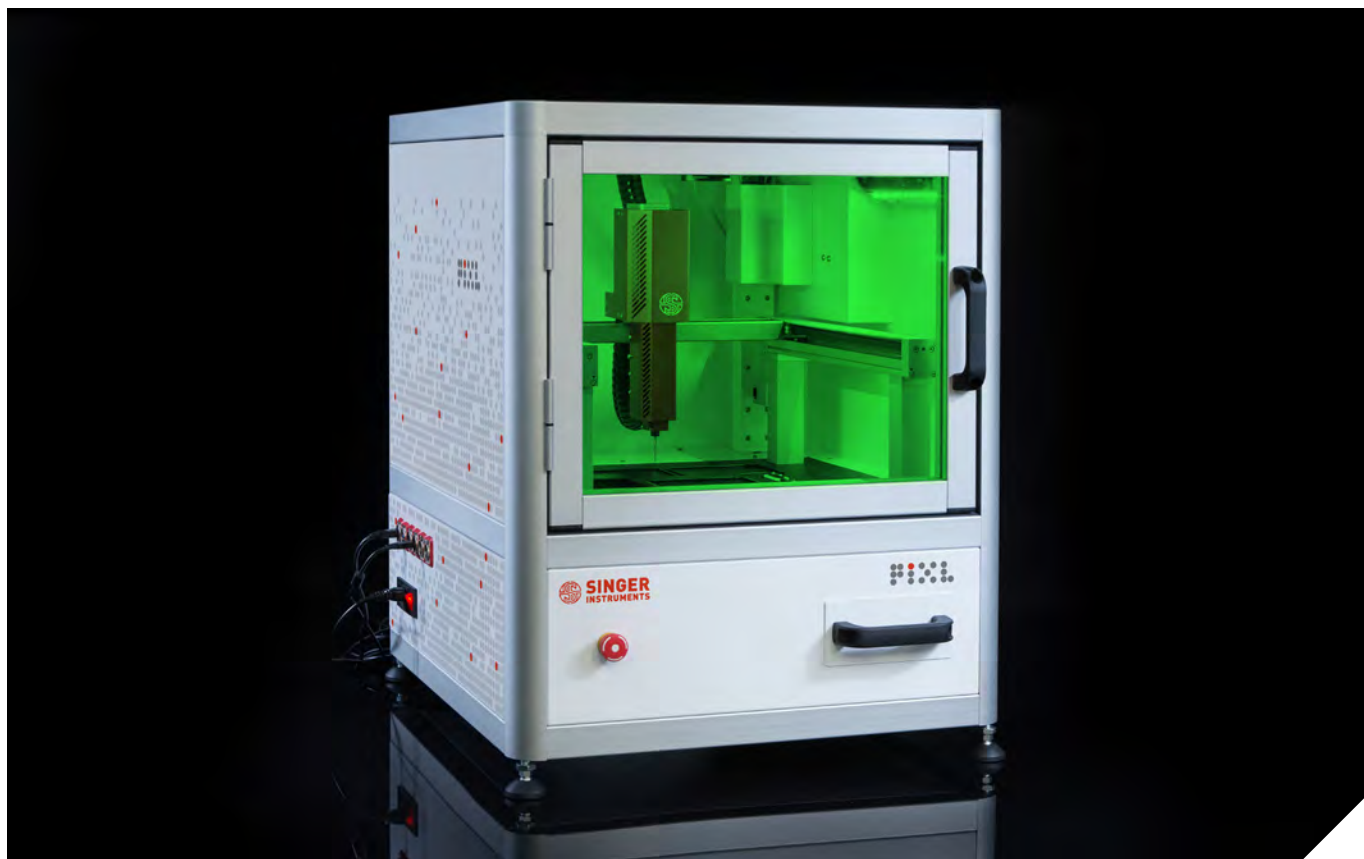
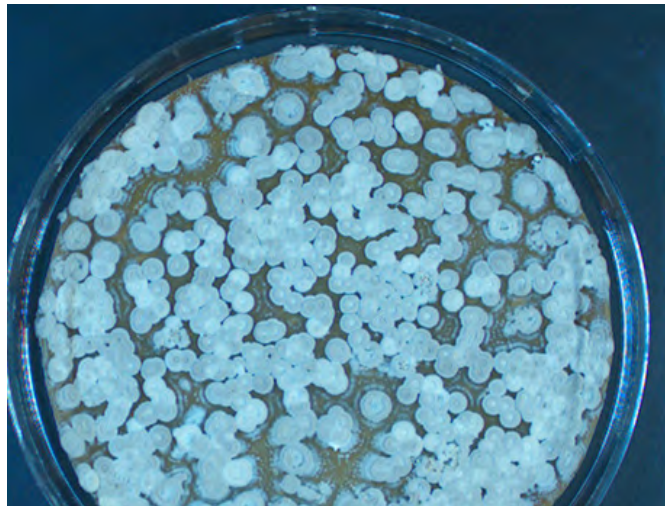
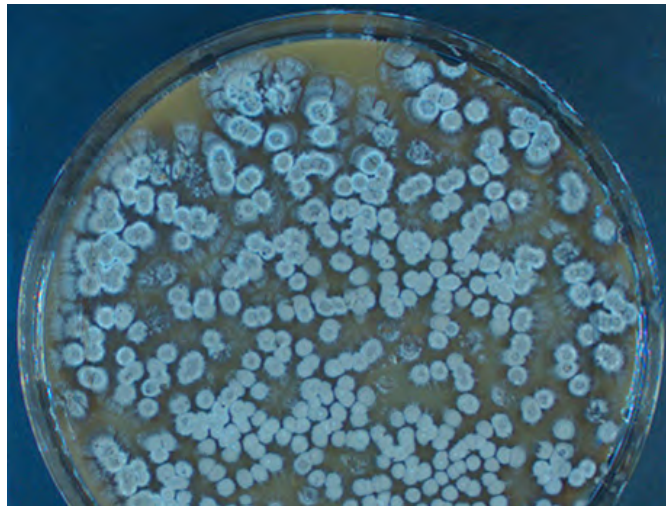
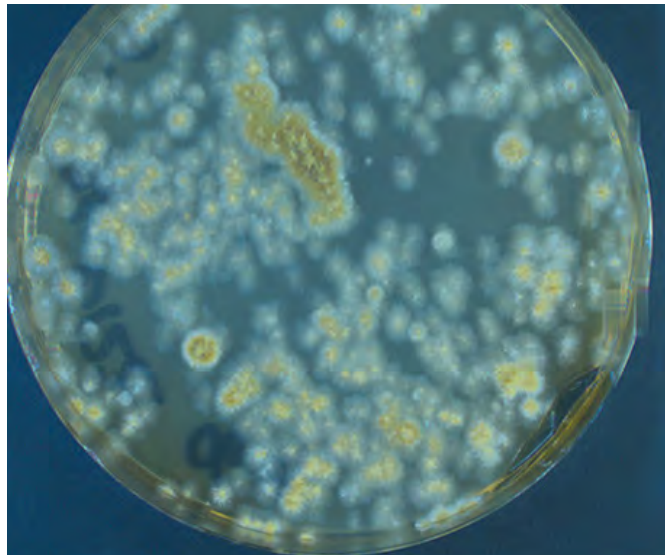
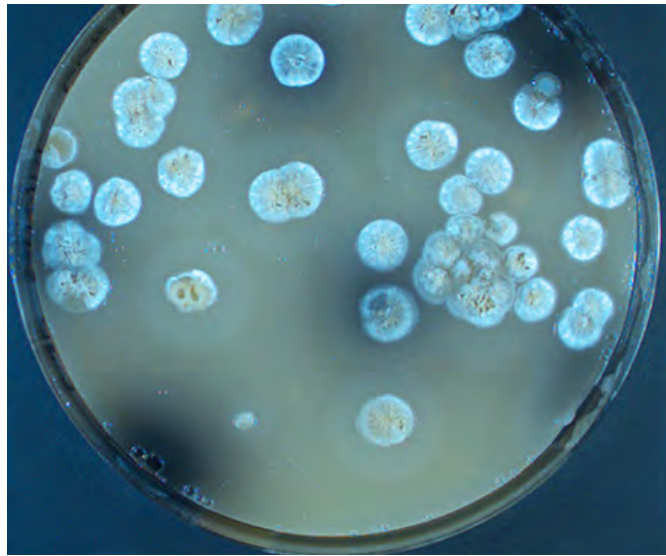


ROTOR+



Trust your
results

To increase throughput, it is essential to automate colony manipulation, by standardising...It is imperative that the robots produce consistent results and show repeatability between runs.



TRANSFER EFFICIENCY

ROTOR+ transfer efficiency is very high across all the RePad and array combinations. Transfer is proven to be 99.68% in *S. cerevisiae* and 99.94% in *E. coli*.

Across different plate types using *S. cerevisiae* and *E. coli* PIXL has an average transfer efficiency of 99.78%. [Read the report here.](#)

"I'm happy to say that every strain we picked and replica plated onto solid agar in the 96 well plates grew, and after three weeks in the incubator, no plate has shown evidence of contamination." Martin Sim, Isomerase.

PIXL uses Pinpoint™ picking technology which automatically measures the height of the agar and uses magnetic contact surface detection on every pick.

STERILITY

PIXL uses specially developed Pinpoint™ picking technology for a step-change in reliability and sterility. PickupLine comes gas sterilised, prepackaged in a sealed bag and is thermally sterilised again, just before picking. Pinpoint uses the freshly-cut end of a sterile PickupLine to transfer microbial colonies.

ROTOR+ uses disposable polymer pin pads, which removes the need for lengthy washing and sterilisation cycles between pinnings (and the associated chance of biological and ethanol contamination of your precious samples).

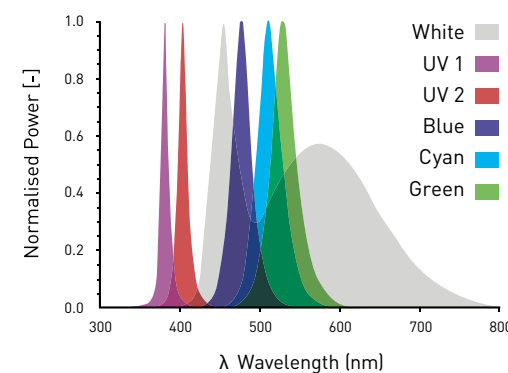
The pin pads come in sealed bags, which are then gamma irradiated, ready to be used. Disinfect your working environment in between uses with the built-in UV light. Run the UV light at the end of the day and ROTOR+ PIXL will turn themselves off.

ROTOR+ PIXL TOGETHER HAVE A CROSS CONTAMINATION RATE OF <0.04%.

FLUORESCENCE DETECTION

Six SpectraStar™ lighting channels enable simultaneous colony detection across multiple fluorescent wavelengths, making experiments quicker and more cost-effective. PIXL will quantify and allow selection for wtGFP, sfGFP, mCherry, tagBFP and Venus as standard. This is not a microscope! It is a colony picker. As such it will not detect sub-cellular or low levels of expression. PIXL's LEDs are configured as standard to emit: Blue, Cyan, Green, two wavelengths of Violet, and white light.

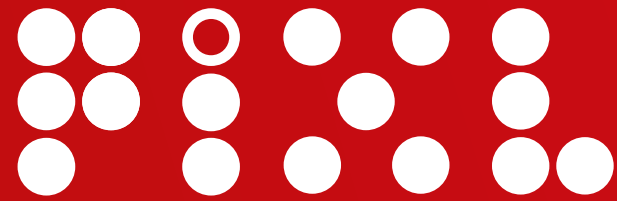
The Normalised Power vs. Wavelength of the LEDs is shown below. PIXL accepts standard 50mm filters. The filters can be manually inserted in front of the CMOS camera on a manual sliding mechanism. You can easily switch between all of your favourite lighting conditions to filter for the markers that interest you. To see if your favourite fluorescent marker is supported, please get in touch: contact@singerinstruments.com



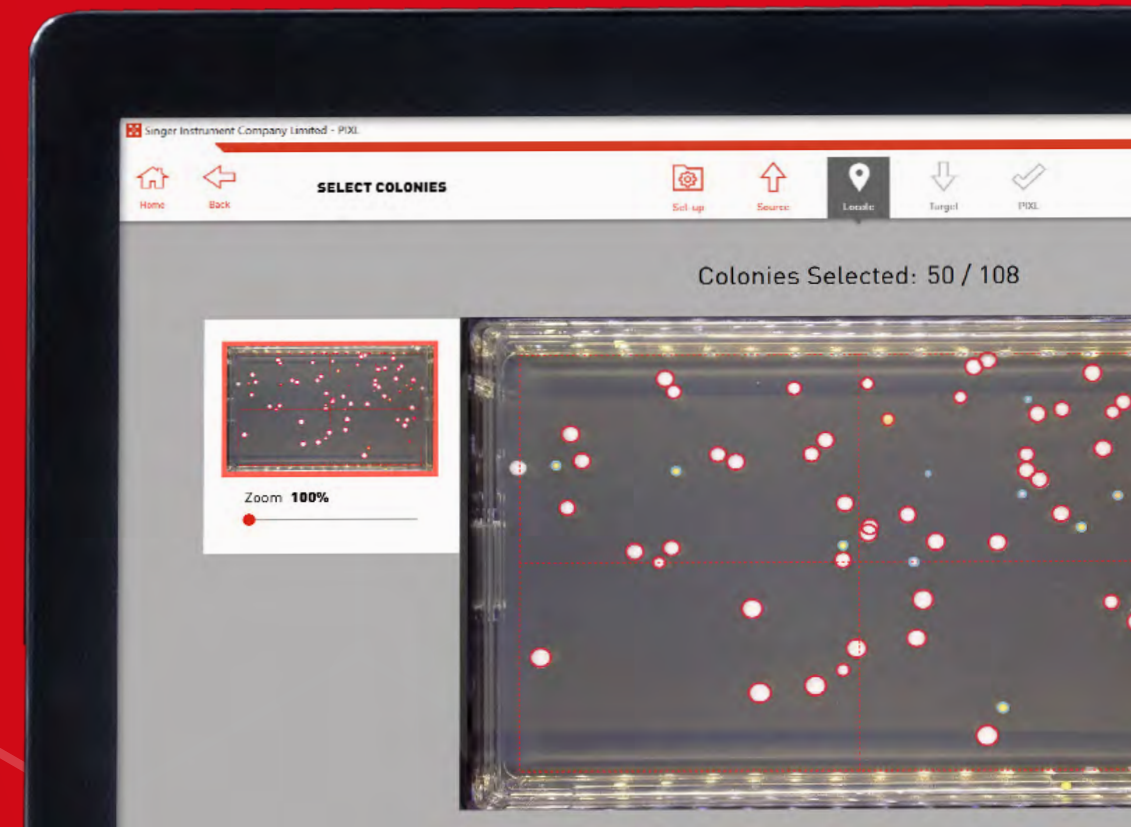
UV 1 380-390 nm	White
UV 2 400-410 nm	Cyan 490-510 nm
Blue 465-485 nm	Green 520-540 nm

ROTOR+

Software



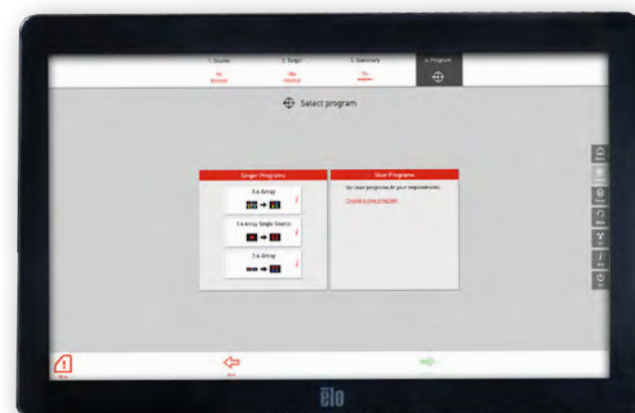
Our software engineers understand your biology!
We recruit scientists and spend a lot of time with our collaborators to ensure our user interface thinks like you do.



IT TAKES LESS THAN 10 MINUTES
TO LEARN HOW TO OPERATE
ROTOR+ / PIXL

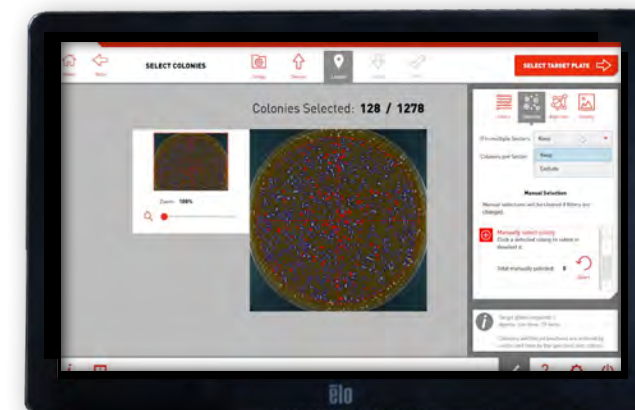
ROTOR+

YOU CAN BEGIN RUNNING YOUR
PINNING PROTOCOL
IMMEDIATELY!



INTUITIVE

ROTOR+ PIXL eliminates any user confusion during operation through its intuitive software. Compatible pin pad and plate options will be determined through your chosen protocol, the step-by-step software minimises human error and makes it virtually impossible for you to select incompatible hardware. The robotic arm moves very rapidly (up to 3 metres per second) and intelligently selects the shortest path between source and target.

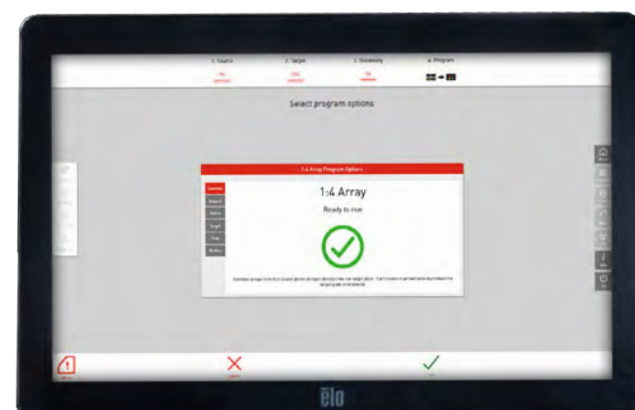


WORKFLOW SET-UP

The user interface will guide you through your workflow set-up to get you picking the right colonies within minutes.

IT'S THIS SIMPLE TO USE, ANYONE CAN DO IT!

- 1. Login
- 2. Load Source Plates
- 3. Select Lighting
- 4. Detect Colonies
- 5. Filter for hits of interest
- 6. Load Target Plates
- 7. Pick Colonies
- 8. Export Images & Data



OPTIMISE TRANSFER

When replicating a single source plate multiple times, tiny, alternating offsets will be applied to the source plate picking position by default, to maximise the homogeneity and consistency of target plate cell density. When spotting liquid to agar, the helical stirring of 96 or 384 well plates is applied by default to maximise cell resuspension and target plate homogeneity. These smart parameters have been carefully optimised to save the user time, they are also fully customisable.

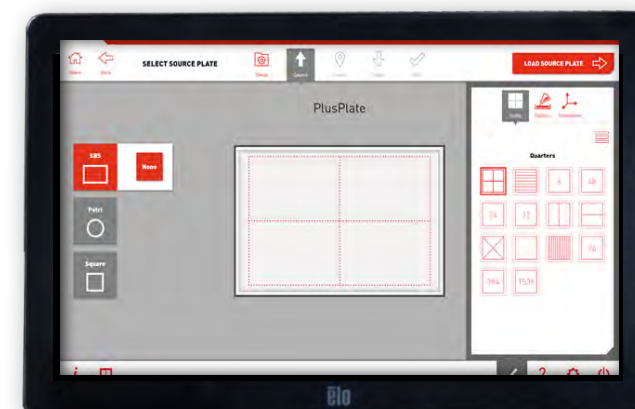


PLATE SECTORING

Sectoring your plates enables you to group multiple clones, isolates, or mutant strains on a single plate. Experiment using different antibiotic, antimicrobial or chemical treatments on the same plate. Sectoring plates increases your workflow efficiency, saves space, and minimises your reagents and consumables expenditure. Conduct multiple experiments at the same time, on the same plate.



DATA EXPORTS

ROTOR+ PIXL facilitates the selection of a multitude of phenotypes and exports rich, time-stamped, experimental data, as well as publication quality images. Cartesian coordinates assigned to each colony allow the user to re-array random colonies or arrays from multiple source plates to a selection of target plates. Connect the exported data to your LIMS, via our free API.



COLONY FILTERING

Filter your colonies by size, proximity, circularity, colour or fluorescence intensity. Multiple filters can be applied simultaneously to ensure you are selecting the most interesting hits.



Benefits

Singer Instruments has a long-standing reputation for fantastic service and support, for which we are very proud. Our motto, 'a responsibility to science', extends to our service and support whereby our primary motivation is to eliminate, or at very least minimise your experimental downtime.

SINGER

LabSupport

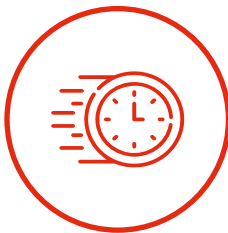


DEDICATED SUPPORT

Singer products are designed for reliability, longevity, speed, and ease-of-use. Singer Lab Support augments these design criteria by increasing life-expectancy and increasing device reliability with preventative and predictive maintenance.



Customer satisfaction
100% out of 137
tickets*



First response time
95% of queries responded
to within 24 hours*



>1000 Successful
Singer Instruments
installations

*ROTOR+ PIXL customer support enquiries from October 2019 - October 2021

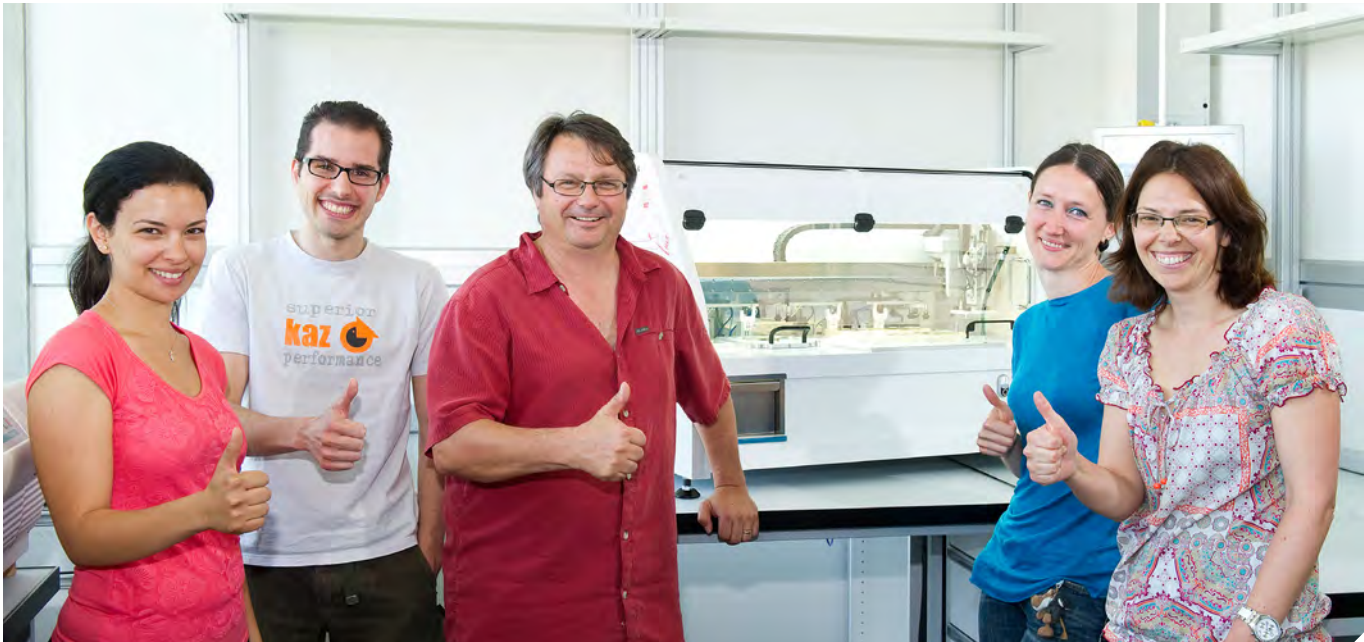
AN EXCELLENT AND COST EFFECTIVE SERVICE THAT GIVES THE LABORATORY
UNLIMITED ACCESS TO SINGER TECHNICAL EXPERTS

by phone, email, VOIP or remote access. All requests are entered into the Singer ticketing system allowing the Laboratory to log, track and monitor any reported issues from initial contact through to resolution.

SERVICE TYPE	NO COVER	LAB SUPPORT	LAB SUPPORT PLUS
Software updates and patches – via remote access	N/A	FREE	FREE
Initial diagnosis + 2 hours support	£410	FREE	FREE
Telephone, Email, VOIP, Webcam support	£127 / hour <i>(min 1 hour)</i>	FREE	FREE
Remote access	£127 / hour <i>(min 1 hour)</i>	FREE	FREE
Unattended remote access <i>(optional)</i>	£127 / hour <i>(min 1 hour)</i>	FREE	FREE
Parts and delivery	Full price	First £100 free <i>{50% discount thereafter}</i>	FREE
Engineer hourly rate	£127 / hour <i>(min 1 hour)</i>	FREE	FREE



Customer service



“Singer Instruments is a wonderful company that makes very high quality tools and put their customers at the heart of everything they do. They provide outstanding support, both engineering and application support. Our ROTOR+ is a workhorse for the lab that has served us for more than 10 years!”

Liz Miller
The Medical Research Council Laboratory
of Molecular Biology

“My lab has used the ROTOR+ from Singer Instruments for many years. The instruments are very reliable and the scientific and technical support from Singer Instruments is outstanding.”

Michael Lisby
University of Copenhagen

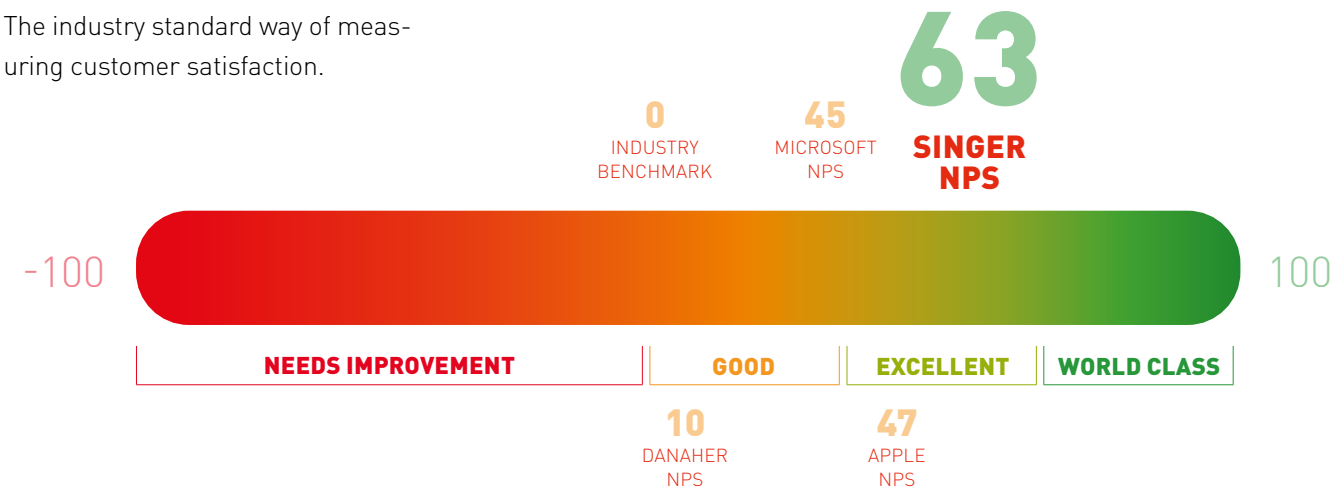
PROVIDING THE HIGHEST LEVELS OF CUSTOMER SERVICE

“Awesome company! Their instruments are well-designed and easy to use, simple and extremely useful. Their customer care is unmatched as far as I’m concerned. It is always a pleasure to deal with them, they listen and care for their scientific customer base.”

Thomas Germe
John Innes Centre

NET PROMOTER SCORE

The industry standard way of measuring customer satisfaction.



Any positive Net Promoter Score (NPS) rating means that a company has more customer advocates (promoters) willing to recommend you than critics (detractors). A score of 0 means that you have as many critics of your products, as you do advocates.

[Click here to view the original online data source.](#)

[Microsoft](#) and [Apple](#) are in the category: Computer software Computer hardware Consumer electronics Digital distribution.

PROVIDING WORLD-CLASS CUSTOMER SERVICE

Singer Instruments’ customer aftercare is outstanding, in fact, it’s the very best in our industry. By maintaining regular contact with our customers, we support your experimental and technical journey from day one. We proactively provide solutions and answer any questions to ensure that you achieve your desired outcome.



Global customer support



Outstanding aftercare service



10,000 Citations and counting

See a **live demonstration**

*INTERACT WITH THE CREATION
OF A WORKFLOW FROM START
TO FINISH.*

BOOK A DEMO

Personalised to your lab, there is no better way to see whether the ROTOR+ PIXL would be able to add value to your research, than via one of Singer Instruments' bespoke online demonstrations. **Specify plate types and your organism of interest, to gain an insight into how your workflow could be optimised.**

Qualified Scientific Advisors will guide you through your demonstration and will be able to answer any questions you may have on your applications of interest, such as:

- Can I pick a certain organism?
- How can I achieve this?
- Can you show me a specific feature?

This demonstration can be delivered one on one, or to larger groups via online video conferencing.



*"THE ACCURACY AND
REPRODUCIBILITY IS EXCELLENT,
EVEN BETWEEN MULTIPLE
MACHINES."*

Prof. Daniela Delneri, FRSB
Chair in Evolutionary Genomics,
Manchester Institute of Biotechnology.

GET A QUOTE

singerinstruments.com

TECHNICAL SPECIFICATIONS

LIGHTING MODEL

White light and UV disinfectant light

TECHNICAL SPECS

Footprint:
Height: 75cm
Depth: 62cm
Width is 161cm

Weight: 114.4kg
110-240V AC 50-60 Hz Power: 500W
Power connection at the right hand end (from front)
via IEC cable (supplied)

AIR SUPPLY

Dry, oil-free, compressed air/nitrogen at min 4 bar (60 psi) max 10 bar (150 psi)
Consumption: 3 litres/min (0.1 CFM)
Air connects to left hand end (from front)

TOUCH SCREEN MONITOR

1x Ethernet Port
2x USB Port
1x RS232 Serial Port
1x KB/MS/LAN2
Edge to edge glass with anti glare

PINNING HEAD

Movement X-axis: 800mm
Movement Y-axis: 30mm
Movement Z-axis: 90mm

PINNING SPEED

Agar to agar: 25 seconds per plate
Agar to liquid/liquid to agar: 28 seconds per plate

SUPPORT OPTIONS

1-YEAR LAB SUPPORT

SLS-002

1-YEAR LAB SUPPORT PLUS

SLS-003

ROTOR+

PRODUCT CODE

RT2-001

WARRANTY

1 year as standard

ASK US ABOUT
DISCOUNTS AVAILABLE
FOR MULTI-YEAR
PACKAGES



LIGHTING MODEL

1x White Channel & 5x Fluorescence Channels

TECHNICAL SPECS

Footprint:
Length: 730mm
Width: 640mm
Height: 805mm

Weight: 100kg
Power: 240VAC at 3 Amps, 100-240VAC Compatible.Hz
Max Power Consumption: 65w

Camera specifications

5MP (2448 x 2048) Resolution
USB 3.0
2/3" Sensor
16mm Autofocus Liquid Lens

MONITOR

21.5" , 1080p Full HD, LED-Backlit LCD Monitor
Edge-to-edge glass display with anti-glare

WARRANTY

1 year as standard

Average picking pressure
<9g/mm²

Transfer efficiency
Agar to agar: 99.78%

Agar compatibility
1.3% -> 2%

PRODUCT CODE

PIX-001

INTERNAL PC SPEC

2.30GHz Intel 6th Gen Dual Core i3-6100U Processor
-20 ~ 60 °C extend temperature operating
2.5" 32GB MLC SSD (0~70°C) - Can be upgraded to:
128GB / 256GB / 512GB
4GB DDR3 Memory
DC-PWR-MIOe – 9V 36V power module

GET A QUOTE

All information is correct at the time of printing. Some revisions may be made as specifications are improved.
For more information please contact:
contact@singerinstruments.com



ABOUT US

For over eighty years, Singer Instruments have been designing and manufacturing cutting-edge scientific research equipment.

No one understands the needs of microbiology researchers and yeast and bacteria manipulation better than Singers. From the automation of tetrad dissection using the MSM 400, to the ROTOR+ personal omics robot, no one has done more to make microbiology accessible to all. From

its headquarters in the beautiful Exmoor National Park in Somerset, UK, Singer ships robotic systems and associated products internationally.

World-leaders in instrumentation for yeast and bacteria, Singer Instruments are working hard to make continual improvements to help assist the scientific community.





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