Experience real colony clarity
Counting *E. coli* colonies is easy. Counting irregular translucent colonies while excluding circular yellow ones isn’t... Unless you have a PHENOBOOTH+
**INTRODUCTION**

Insert a Petri dish or SBS plate with visible bacteria, yeast, or other microorganism into the input tray; select your preferred lighting; autofocus and capture your plates in seconds. Using powerful software, filter for properties of interest just once; hit ‘Batch Analyse’ and walk away as PhenoBooth+ automates tedious analysis across all of your plates with a single click.

Colonies can be filtered by size, circularity, colour and brightness. Manually export your high-resolution images and .CSV data for further analysis if required.

**WHAT IS IT?**

The PhenoBooth+ Colony Counter is a fast, super-easy to use camera for imaging and analysis of colonies on agar. Featuring a 41MP scientific-grade camera, and 4-channel, flat field, SpectraStarTM incident or transmission illumination, you can capture high-resolution colony images from Petri dishes or SBS plates.

**HOW DOES IT WORK?**

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**WHY DO I NEED IT?**

- Pick the hits that interest you – Filter colonies by: size, colour, circularity and brightness.
- Detect fluorescence – With 4 lighting channels.
- Count with confidence – Separate touching colonies.
- Stop wasting effort – Leave nothing undetected.
- Trace them all from E. coli to fungi.
- Remove variables – Batch processing and analysis of your plates with a single click.
- Publish your images – Examine your colony images in full colour and high resolution.
- Traceable results – Unique colony IDs; time-stamped, with morphological data.
- Future-proof your lab – Upgrade PhenoBooth+ with advanced software packages such as Colony Picking or Screening.
Redefining colony clarity

**Saccharomyces cerevisiae**

Colonies at 300% magnification

**PHENOBOTTH+ CAMERA**

41 megapixel camera. Scientific grade, HD CMOS.

**23MP PLATE RESOLUTION**

This figure is based on the cropped, visible plate region. The highest resolution for SBS/ANSI format (rectangular) plates is 5626x4220 = 23.74MP

Image is an unedited export, directly from Phenobooths.

The above results were achieved with the following settings:
- Power: 0.5
- Brightness: 0
- Gain: 0
- Exposure (ms): 4
- Hue: 0.5
- Saturation: 0.19
Extremely Versatile

- Detect various organisms
- PlusPlates and Petri dishes
- High-res morphological data
- Arrayed and random colonies
- Batch processing

YOU CAN EXPERIENCE A 94% TIMESAVING OVER MANUAL PROCESSING WITH PHENOBOOTH+
Multiple Lighting Options
The PhenoBooth+ comes with white top and back lights as well as three extra colour channels of top light illumination. Screening for fluorescence on agar is advantageous because it is cost-effective and offers incredibly high throughput (up to 6144 colonies on an SBS plate). While PhenoBooth+ can detect fluorescence, bear in mind this is a macroscopic CCD imaging workstation and not a microscope. As such, it will not detect subcellular or low levels of expression. The PhenoBooth+ accepts standard 25 x 5mm filters in a two-position filter cartridge. The filters can be selected on a manual sliding mechanism. You can easily switch between two of your favourite image modes.

**FLUORESCENCE**

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**WAVELENGTHS**

The PhenoBooth+ comes with white top and back lights as well as three extra colour channels of top light illumination.

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Relative Intensity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>375 - 400</td>
<td>Violet: 50% intensity range</td>
</tr>
<tr>
<td>420 - 440</td>
<td>Blue: 50% intensity range</td>
</tr>
<tr>
<td>490 - 530</td>
<td>Cyan: 50% intensity range</td>
</tr>
<tr>
<td>500 - 600</td>
<td>White: 50% intensity range</td>
</tr>
</tbody>
</table>

Source: Cree, Vishay and Lite-on data sheets.

**FILTERS**

The PhenoBooth+ accepts standard 25 x 5mm filters in a two-position filter cartridge. The filters can be selected on a manual sliding mechanism. You can easily switch between two of your favourite image modes.

**TOP LIGHTS**

Violet: 50% intensity range from 375 - 400nm, with peak ~390nm.

Blue: 50% intensity range from 465 - 475nm, with peak at 470nm.

Cyan: 50% intensity range from 490 - 530nm with peak of 510nm.

**DESKTOP & SCREEN**

Micro desktop with 21.5” monitor with Mouse and Keyboard included.

**BACKLIGHT**

Integrated SpectraStar transmission illumination for high-fidelity back-lit images (White channel only).

**FUNCTION LIGHT**

Light indicator to signal operation status.

**FILTER TRAY**

PhenoBooth+ accepts two standard 25mm circular filters with a maximum height of 5mm.

**INPUT TRAY**

Rectangular SBS plate tray with optional Petri dish adaptor.

**TOP LIGHT**

Integrated SpectraStar incident illumination for high-fidelity top-lit images. White, blue, cyan and and violet channels to choose from.

**USB 3.0**

Connections for micro desktop PC.

**PROF. DANIELA DELNERI, FRSG**

Chair in Evolutionary Genomics,
Manchester Institute of Biotechnology

**"WE HAVE RELIED ON ROTOR, STINGER AND PHENOBOOTH+ FOR MANY HIGH-IMPACT PAPERS, THEY HELP INDIRECTLY FUND OUR LAB!"**
Easy-to-use software accurately counts and measures many colony properties. The PhenoBooth+ software is powerful yet flexible, offering a variety of custom-made packages to automate your entire analysis workflow. Need more than a simple colony count? You’ll love PhenoBooth+.

**THE NEXT GENERATION OF COLONY ANALYSIS**

**TECH OVERVIEW**

**SOFTWARE CAPABILITIES**

- Image acquisition up to 5626x4220
- Full control of imaging parameters including: power, brightness, gain, exposure, hue, saturation and white balance
- Image import, background subtraction and cropping
- Image with violet, cyan, blue, white and bottom transmission light
- Ability to separate overlapping colonies
- Filter by size and circularity, remove unwanted objects and overgrown colonies
- Automatic software updates (with a valid PhenoBooth+ licence and internet connection)
- Export your results to CSV
If counting randomly distributed colonies is what you need, then PhenoBooth+ has this covered.

If you are interested in picking those colonies or if you are doing experiments that require advanced genetic or protein interaction screen analysis then read on to learn about the software upgrades.
**COLONY PICKING UPGRADE**

The Colony Picking Package is a software upgrade for the PhenoBooth+ Colony Counter. Precise coordinate export of randomly distributed colonies on agar using rectangular PlusPlates or 90mm Petri dishes for re-arraying into liquid or agar using the Stinger Colony Picker from Singer Instruments.

**WHY DO I NEED IT?**

- **Pick the hits that interest you** - Filter colonies by: brightness, size, colour and circularity.
- **Don’t compromise your research** - Pick colonies with high levels of accuracy.
- **Stop wasting effort** - Filter colonies in your first image and batch apply settings to all others.
- **Give yourself flexibility** - Export a Stinger-ready colony picking routine, for colony transfer into liquid or agar SBS plates.
- **Get high-throughput** - Pin to 96, 384, 1,536 and 6,144 density arrays.
- **Save time** - Pin colonies to many plates using a single .CSV file.
- **Trust your results** - The Stinger agar surface detection prevents missed colonies and cross-contamination ‘splashing’ of cells, both common problems when picking from uneven agar.
- **Automate your lab** - Integrate PhenoBooth+ with The Stinger across a single network.

Prefer a dedicated high-throughput robot? Discover our new PIXL Precision Colony Picker. singerinstruments.com/solution/pixl

**OVERVIEW**

![Stinger picking exported colonies](image)

**COLONY SCREENING UPGRADE**

The Colony Screening Upgrade is a software package optimised for use with the Singer ROTOR Colony Replication Robot. It offers high-throughput quantitative analysis of your Synthetic Genetic, Yeast 2-Hybrid or Random Mutagenesis arrays — allowing your image analysis to keep up with your high-throughput pinning.

The Colony Screening upgrade also includes the new web application offering new advanced analysis and visualisation of colony data sets exported from the PhenoBooth+. It includes: new in plate and multi-plate normalisation options; boxplots and heatmaps; and more experimental design options based on all of your feedback.

**WHY DO I NEED IT?**

- **Find the phenotypes that interest you** - Screen colonies by: size, intensity, colour, circularity or brightness.
- **Save time** - Image pre-processing, measurement, analysis and visualisation with a single-click.
- **Detect hits in real time** - Mouse over a colony and see its gene name and variation from control and replicates instantly.
- **Understand results faster** - Inbuilt heatmap visualisations highlight growth differences between your control and aggregated experimental conditions.
- **Get the best results** - Nothing compares. Detect every colony, every time at 96, 384, 1,536 and even at 6,144 array densities.
### TECHNICAL SPECIFICATIONS

#### HARDWARE SET-UP

**LIGHTING MODEL**
Top and bottom white illumination plus three colour channels included as standard.
- PhenoBooth+ Lighting
- 85 channels

**TECHNICAL SPECS**
Footprint:
- Width: 305mm
- Length: 305mm
- Height: 316mm

- Weight: 16kg
- Power: 100-200 VAC 50-60 Hz
- Max Power Consumption: 65w

**CAMERA SPECIFICATIONS**
- Scientific grade, HD CMOS
- 41 MP Camera - 23 MP Plate Resolution
- Autofocus

**MINI DESKTOP AND MONITOR**
- Intel® Haswell Core i5-9500
- 8GB RAM DDR4
- Microsoft Windows 10 Pro 64-bit
- 128GB Solid State Drive-M.2 SSD
- 21.5" Monitor
- Micro-desktop: Dell OptiPlex 3070 Small Form Factor
- Desktop keyboard 442mm x 127mm x 254mm
- USB Mouse

**WARRANTY**
1 year

#### SUPPORT

- **1-YEAR LAB SUPPORT LITE**
  - SLS-001

- **1-YEAR LAB SUPPORT**
  - SLS-002

- **1-YEAR LAB SUPPORT PLUS**
  - SLS-003

#### ILLUMINATION

- **CAMERA & TECH**

#### STANDARD SOFTWARE SET-UP

**MODEL**
PhenoBooth+ Colony Counting Package

**PRODUCT CODE**
PHS-001

**LICENCES**
3 user licences for 1 year [all 3 licenses start from the date of first activation]

#### UPGRADE SOFTWARE PACKAGES

**COLONY PICKING PACKAGE**
PHS-002

**COLONY SCREENING PACKAGE**
PHS-003

**COMPLETE SOFTWARE PACKAGE**
[Includes the above 2 packages]
PHS-004

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
SCALABLE AND INTEGRATED PACKAGES

Request a quote, more information or an online demo

BOOK A DEMO

“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
ABOUT US

Singer Instruments was established in 1934 and has a long-standing track record developing and manufacturing mechatronic workstations and laboratory automation robotics. Our world-leading, specialist products are used to facilitate and accelerate genetic and genomic research around the world. We supply public and private research institutions in multiple facets of biological sciences including Genetics, Neuroscience, Systems Biology, Cancer Biology, Biofuel Engineering and Microbiology.

Our premises, on the edge of Exmoor National Park in Somerset, England, is a state-of-the-art facility with full, virtual prototyping facilities, precision CNC manufacture and robotic coordinate measurement for quality control. We design, manufacture, program, assemble and QC all of our core products on site.

Having worked alongside and added value to laboratory research for over 40 years, we are a truly integrated and respected member of the genetics research community.
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