



 **SEED AUTOMATION
MADE EASY**
FROM BATCH TO DATA

 **HAVE A QUESTION?
NEED SOME HELP?**
CONTACT US FOR ANSWERS

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Introduction

For many process in the lab, seeds will have to be individualized for analysis or growth. This can be required for DNA extraction, germination, sowing, phenotyping and an range of other applications. Our SeedPickers will individualize seeds from multiple batches, fully automatically. This process is completely controlled by imaging, barcodes and vacuum measurements during each movement.

Synchron offers several models, based on two different platforms: a desktop 3-axis gantry system and an industrial 6-axis arm. The larger system can easily be upgraded with more stacker capacity, a range of tools and modules and even be integrated into our conveyor based systems for further automating your process.

The SeedPicker systems allow for processing different types of seed within a single run with an almost 100% accuracy through the use of a special vacuum control on individual, auto-changeable picking tools. For larger seed batch sizes, our soundwave controlled shaker can make every seed available to be individually picked as well as returning the unused seeds back into the original seed container. The software is comprehensive but can be adapted to specific customer needs.

Our SeedPicker family automates and controls the individualization of your seeds with great accuracy in a fully automated manner.

More information

Information sheets on the products and applications are available on request. If you would like to discuss these products or a custom engineering project, please feel free to contact us by email or phone:

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About Synchron

Synchron develops custom-made laboratory automation solutions and specializes in automated liquid handling and sample handling. Within its branch of industry, Synchron is renowned as a progressive and innovative company. Since 1985, we have been developing custom products based on excellent relationships with manufacturers of laboratory instruments. Our products, both software and hardware, are now widely used in laboratories. Synchron offers expertise in all areas of automation and has a wealth of experience developing and marketing flexible robotic automation. In Synchron, you have a dedicated and experienced partner who can help you realize your automation projects efficiently and cost effectively around your existing laboratory.

Synchron has successfully realized over 100 different laboratory automation projects by applying its total solutions approach. The Synchron capabilities include total system design and realization, ranging from stand-alone customized instruments to complex integration of existing systems, featuring robot barcodes and fully incorporated LIMS systems. Whatever your application, you can trust in the Synchron characteristics of cutting edge technology and long-standing experience in laboratory automation.

Our AgBio product line is a range that has been designed as products rather than as a unique project. These products are designed by taking the requirements from several customers into consideration and packed into a single system. In the process from seed to data we have several solutions available. We would welcome you to share your automation needs with us and together discuss about a suitable solution for your applications.

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WWW.SYNCHRONLAB.COM

- LabPicker
- SeedPicker
- SeedPicker XL
- PhenoPicker
- SeedSowing Line



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Seed Picker Family



The LabPicker

This small desktop version is a system that allows for picking seeds on a small surface for when accuracy is more important than capacity. All input and output containers are placed on the deck before starting a run. Depending on the seed type the system can pick from a multi- or monolayer of seeds into any container, plate or tray that will fit the picking area. The LabPicker utilizes the imaging, vacuum control and software of its larger sibling, the SeedPicker. The 3-axis base allows for seed picking in an up-down (Z) direction and move between XY coordinates. The LabPicker is a cost efficient platform that will automate the individualization of your seeds for many applications.



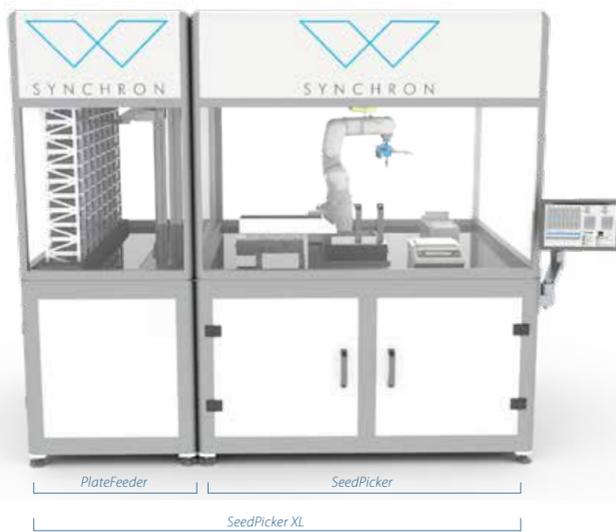
PhenoPicker

Picking and placing seeds for high throughput applications like DNA extraction, germination and sowing, may only require a sensor to identify individual seeds. When more phenotypic information from each seed needs to be captured, our PhenoPicker integrates a balance and multiple sensors for post-picking seed analysis. Sensors include RGB imaging for 2D or 3D reconstruction (shape, volume/weight ratio), chlorophyll fluorescence and multi/hyper spectral imaging. The 6-axis arm allows for positioning seeds in several different imaging chambers where illumination and other important imaging factors can be fully controlled. After measuring, each seed can be placed into an individual well, container or tray for the next step in the process.

The SeedPicker

The SeedPicker is our flagship system, based on an industrial 6-axis robot arm. This arm can move plates across the deck for (un)loading microplates and seed trays from stackers onto different deck positions. The 6-axis allow for tilting seed containers onto the shaker, orienting seeds (turn or tilt) before placing and many more functions. This size of the SeedPicker enables the integration of larger modules, like the soundwave controlled shaker, a balance, stackers, a grinding beads dispenser and imaging boxes for multiple phenotyping sensors.

With a payload of up to 8kg, the SeedPicker carries a gripper, picking tool changer, barcode sensor and several other sensors, to allow for complex handling and control functions. Upgrading the SeedPicker with external automation modules like the TrayFeeder, PlateFeeder or integration in a conveyor based system is also possible.



The SeedPicker XL

The XL version of the SeedPicker has an external stacker system called the PlateFeeder. This system allows for the stacking of up to 200 plates in either random-access or FiLo stackers. The robot arm of the PlateFeeder will scan, identify and (un)load microplates in the stackers to/from the SeedPicker deck. This option will allow the SeedPicker to work for longer periods at the time, like overnight. Other than creating a higher capacity, the PlateFeeder also increases the operation speed of the SeedPicker as it (partially) takes care of the plate moving function.

SeedSowing Line

In contrast to large sowing systems that use only one type of seed per run, our SeedSowing Line is designed to run a large number of very small seed lots without losing any seeds of your costly breeding material. For automating accurate and flexible seed picking into many sowing trays, Synchron offers a modular system for the constant supply of small seed batches from the PlateFeeder and sowing trays from the TrayStacker. The conveyor based system brings seed batches and trays together in a SeedPicker module, that allows custom sowing patterns of multiple seed lots per tray, without losing any seeds. The unique vacuum control system ensures delivery and prevents delivery of multiple seeds in any position. Based on our LabFactory concept, this modular system can be easily configured to your exact needs. It also allows you on-site to plug-in additional SeedPicker modules and/or stackers to increase throughput, change configuration and add custom building blocks.



Standard Modules

- Vision – We offer optimized vision sensors to detect individual seeds.
- Vacuum/pressure box – Each system includes our vacuum/pressure control box with a database of settings for each type of seed to allow accurate and fast pick & place.
- Orbital or soundwave controlled shaker – Choose between the cost efficient orbital shaker or the ultimate control of our sound wave controlled shaker, to individualize the seeds for picking.
- Auto-changeable picking tools – We offer a range of different picking tool shapes and sizes, so every type of seed can be picked. The auto-change tool allows for loading multiple tools on the deck and change of tools within a single run.
- Balance – For recording of individual seed weight.

Configurations

	LabPicker	SeedPicker	SeedPicker XL	PhenoPicker
Camera	✓	✓	✓	✓
Pick & Place	✓	✓	✓	✓
Analytical	X	✓	✓	✓
Shaker	X	✓	✓	✓
Orbital	X	Optional	Optional	Optional
Sound controlled	X	1	1	1
Stacker	X	8	X	2
Plate Feeder	X	X	✓	X
Combined function tools	✓	✓	✓	✓
Single pick tool	✓	✓	✓	✓
Multiple pick tool	X	✓	✓	X
Plate gripper	X	✓	✓	✓
Tube gripper	✓	✓	✓	✓
Analytical balance	X	X	X	✓
Barcode reader	✓	✓	✓	✓
Imaging chamber(s)	X	X	X	✓



Types of Seeds picked

Corn - Rice - Soy - Tomato - Pepper - Lettuce - Cucumber - (Water)Melon - Spinach - Onion - Rape - Carrot - Beans
Spinach - Endive - Eggplant - Cauliflower - And many more...