Robot One

Brochure

Robot One
About Robot One

Robot One

A smart agricultural robot designed for chemical-free weed control in large-scale environments.

Robot One is a laser weeding robot designed for large-scale, chemical-free farming. It offers growers the freedom to reduce dependency on herbicides and tackle labor shortages with an efficient, automated solution.

Using high-power CO_2 lasers, Robot One removes weeds with unmatched accuracy. The laser targets each weed individually, heating the plant tissue until the cells burst, eliminating growth without disturbing the soil. Its modular design ensures long-term flexibility, making upgrades and maintenance simple and cost-effective.

With advanced computer vision and GPS guidance, Robot One targets each plant with millimeter precision. It combines smart technology with reliable performance, helping growers work more accurately and sustainably with laser precision for tomorrow's harvest.

Lasting Solutions with Proven Technology

Through active involvement in scientific and collaborative research projects, we combine proven technologies into new long-term solutions for sustainable farming.

Eradicate weeds with our high-power CO₂ lasers

Laser is a young technology in agriculture with great potential. It offers growers a sustainable and efficient way to remove weeds without chemicals. Robot One makes laserweeding practical for large-scale farming. Precise, reliable, and ready for everyday use.

Robot One removes weeds using CO_2 laser technology. A CO_2 laser generates a powerful beam of light by energizing carbon dioxide gas inside the laser unit. This light is invisible to the human eye but extremely focused and consistent. When the beam is aimed at a weed, the energy is absorbed by the plants' surface and converted into heat. The heat causes the plant cells to burst, stopping the weed from growing without disturbing the soil or nearby crops. The process takes only a fraction of a second and leaves the soil structure completely intact.

The use of light energy instead of chemicals means that there are no residues after treating the plant. The treated weeds stay in place and break down naturally, returning organic matter and nutrients to the soil. This makes the process completely residue-free and regenerative.

The result is simple: less manual weeding, healthier soil, and more freedom for growers to work sustainably without compromising on precision or efficiency.

Robot One
One Robot, Endless Possibilities

No farm is the same. Row or lane spacing varies per cultivation. That is why Robot One is designed with modularity in mind. Customize Robot One for your field operations by choosing the right size.

ROBOT ONE
300

The base model of Robot One is suited for medium to large-scale operations. Covering a bedsize of 3 meters, it offers enough capacity for most growers.

Working width	300cm, 320cm, 340cm
Lasers	120W CO_2 Laser modules
Power	Solar + Range Extender
Battery	13 kWh

Robot One - Product

Robot One
Measurements

A	Overall width	3860 mm
B	Overall length	2462 mm
C	Overall height	2235 mm
D	Body clearance	873 mm
E	Axel clearance	290 mm
F	Tire width	250 mm
	Net weight	2300 kg

*Specifications can vary per Robot One configuration
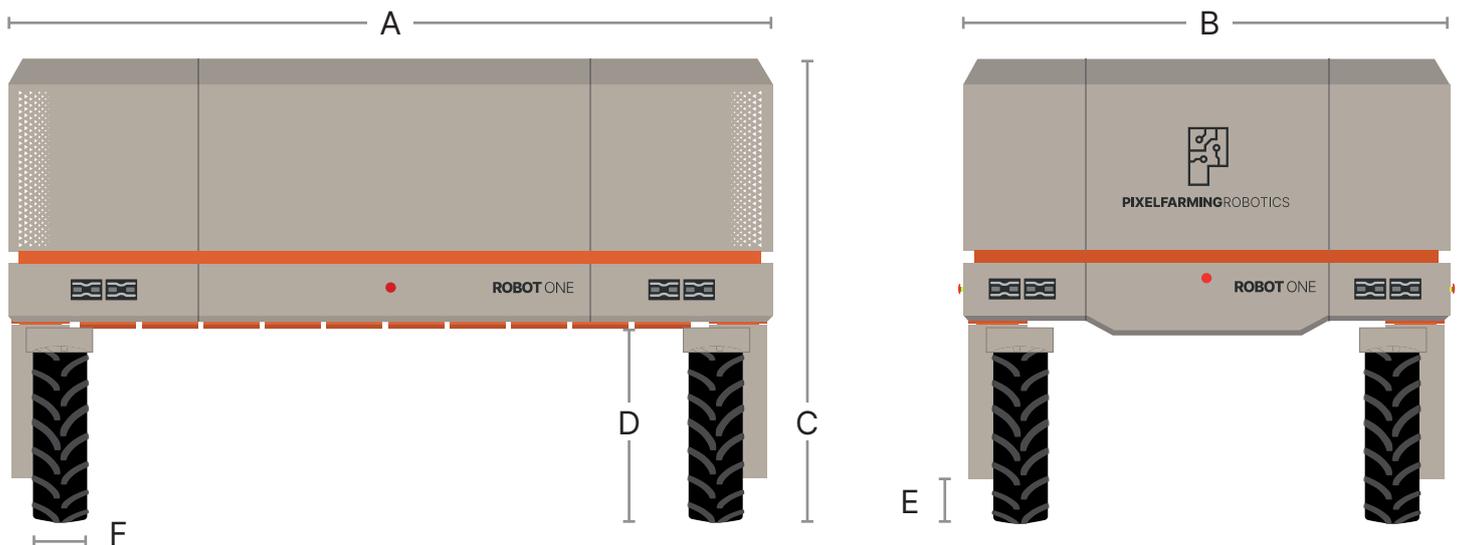
Robot One
Wheelmodes

Inward
Longitudinal
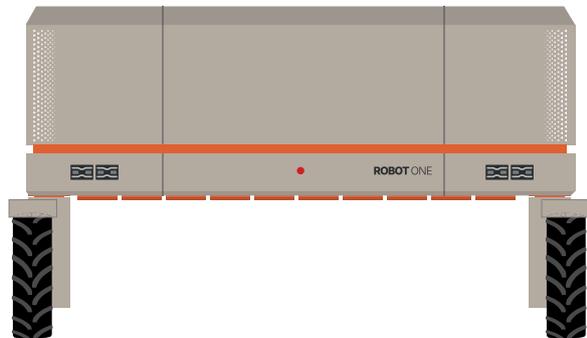**300cm**
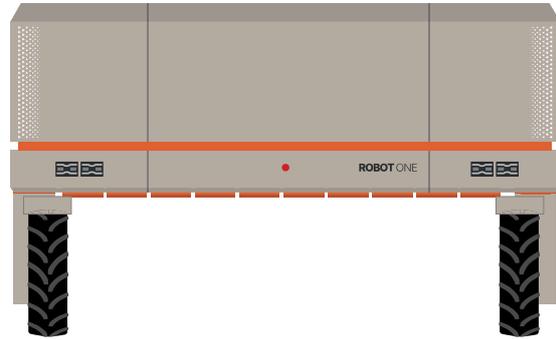
Outward/Inward
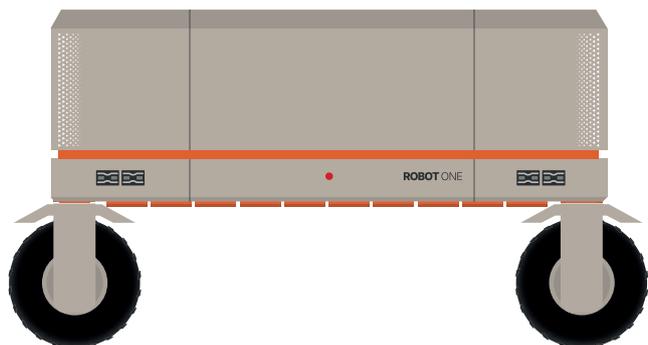Longitudinal
320cm
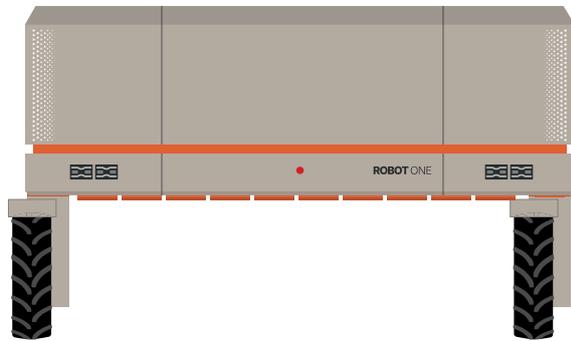
Outward
Longitudinal
340cm

Transport mode
Transversal
180cm

Working widths are measured from heart to heart of the tires. Actual sizes can be adjusted using wheelspacers.

The wheelunits on Robot One can turn 360 degrees. This allows it to swiftly adjust its driving direction or working width. Every rotated wheelunit adds or subt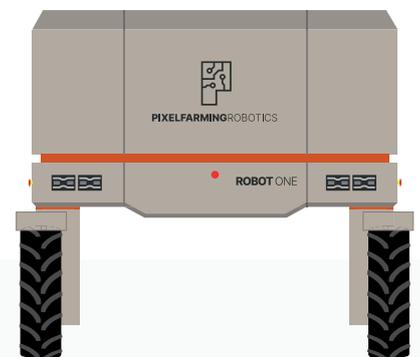racts 20cm of working width. This means that both directions of travel have 3 available working widths. When the standard working witdhs do not suit your specific cultivation, wheelspacers can be installed to create the desired width.
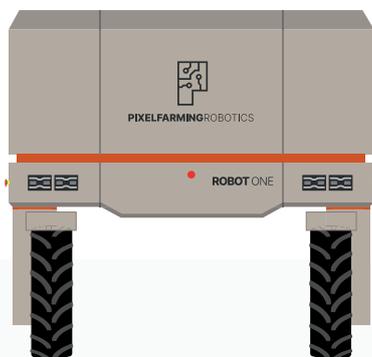
Inward
Transversal
180cm
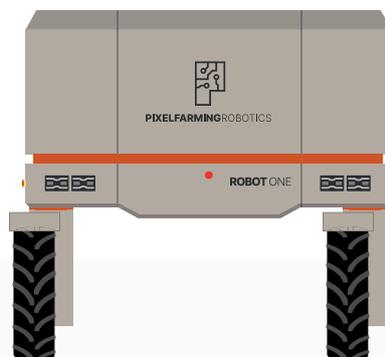
Outward/Inward
Transversal
200cm

Outward
Transversal
**220cm**

Robot One - Wheelmodes

Robot One
Power System

Robot One is fully electric. Four main batterypacks supply the power needed for laserweeding, navigation, data processing, drive and more.

Battery life depends on multiple factors like weather, field conditions and working speed. To reduce downtime for charging, Robot One is equipped with solar panels on the roof.

For growers who need extended operation time or work on larger fields, a hybrid range extender can be integrated. This optional module recharges the battery during operation, providing additional flexibility and longer working hours when needed.
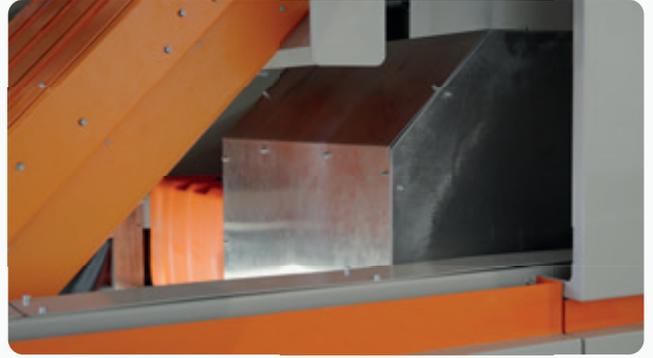
Range Extender

The range extender is a modular system that can be installed on Robot One in order to extend its operating time. The diesel generator powers generates power to charge the batteries while Robot One is in operation.

Solar Power

The solar panels on top provide Robot One with energy when the sun is out. On a bright day the drive and computation systems can be fully sustained on solar power.

Robot One - Power system

Upgradability and customization

Robot One is designed to grow with the needs of the grower. Its modular design allows it to be upgraded over time.

Hardware upgradability refers to the ability to upgrade or replace components such as the main processing unit, onboard GPU's for machine learning and laser units.

Modular design

Robot One is designed to be modular at its core. Each component of Robot One, is engineered so it can be swapped or upgraded when a new version of the technology is released.

Adaptable to your production

Robot One's flexible design makes it possible to configure the robot for different crops, soil types, and field conditions, making it a versatile solution for various agricultural systems.

Performance through innovation

Technology moves at a fast pace. Upgrading to newer components, such as improved sensors, processing units, or power modules allows growers to benefit from the latest technological developments.

Focused on long-term reliability

By upgrading specific components growers extend the lifespan of their machine and reduce the total cost of ownership. This approach supports both economic and environmental sustainability, offering a smarter and more responsible way to scale innovation in farming.

Scan & Act
Base principles
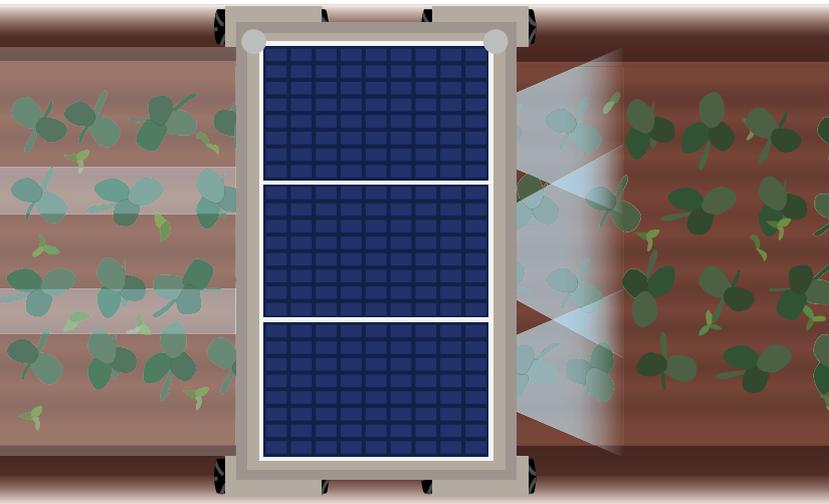
Scan

Perform a scan run on the first few meters of your field. During the scan run, Robot One captures detailed images of both crops and weeds. Images are stored for training your plant models. Once the scan is complete, the data is transferred to Pixelfarming Academy.

Training

Use Pixelfarming Academy to organize and labeled your plant data. After you have labeled enough images you can start the trainer. The AI will create a plant recognition model trained to work on your crops and on your field.
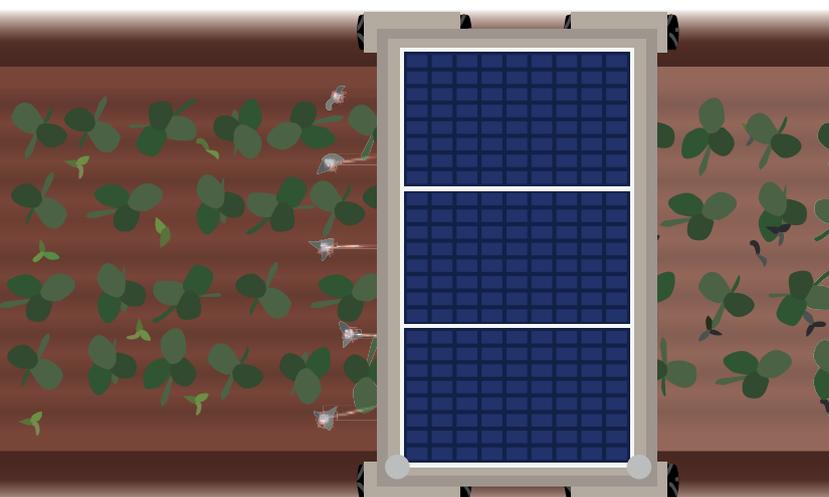
Act

With the new plant model Robot One is ready to act. it can navigate the field autonomously, while the cameras are detecting the weeds using the plantmodel. These detections gets targeted where the laser can have the most impact.

Easy to operate

Using the Intuitive controller with integrated display.

Robot One is designed with ease of use in mind. Basic functions are operated with physical controls. The display provides intuitive navigation through Robot One's various functions and settings. This allows you to make advanced adjustments, directly in the field, without a bulky laptop.

Robot One is easy to operate with minimal training.

Robot One
Specifications

Tires	Standard tire	Designation	BKT TR 144
		Section width	245 mm
		Construction	BIAS
		Tire size	9.5 - 16
		Overall diameter	850 mm
		Rolling circumference	2558 mm
Power	Batteries	Capacity	72 Ah per battery
		Voltage	48V
		Amount of batteries	Robot One is standard equipped with 4 batteries
		Charger	included 1-phase 220V / 230V AC
	Solar Panels	Max Output	750W
Drive	Wheelunits	Amount	4 wheelunits
		Maximum mechanical horsepower	32 hp
		Rotation	360 °
		Steering modes	4-wheel steering, crab-steering, rotation mode
Lasers	Laser Units	Type	R1-24
		Amount	Max 10
		Power	120W
		Capacity	10.000 shots per laser per hour

*Specifications can vary per Robot One configuration

Robot One
Specifications

PIXELFARMINGROBOTICS

Internals	Processing modules	Main controller	NVIDIA
	Drive controller	Type	R1-24-Auto
		Calibration	Automatic with line sensor per wheel
		Drive modes	Width-mode, length-mode, rotational mode
		Working modes	6
	Remote controller	Type	R1-24 H30
		Screensize	10.1 inch
		Weight	1.5 kg
		Batterylife	<5 hours
	Communications controller	Type	R1-24-5G Wi-Fi
		Wi-Fi	2.4 Ghz
		Mobile	3G, 4G, 5G
	Intrusion controller	Type	R1-24-4S
		Cameras	4x stereo HD
	Battery management	Type	R1-24-RX1
		Battery packs	Max 4
		Range extender support	Yes
	Vision controller	Type	R1-24-Base
		GPU architecture	NVIDIA Ampere
		CPU architecture	X86
	Data storage	Type	R1-24-SSD-1TB
		Capacity	1 TB

*Specifications can vary per Robot One configuration

Pixelfarming Robotics
Origin

Campus Almkerk

The birthplace of Robot One and home of agricultural innovation.

In 2017 we moved the office to an old farm in Almkerk. We restored the farm to it's former glory and built a campus. It is on these grounds that we started to experiment with the first prototypes of the Robot One.

What started as a side project for saturdays, became a company in 2019. Inspired by the idea of autonomous, chemical-free farming with the use of robotics, our engineers went to work. To this day we use this location as home for our research and development team. Here we have the ability to design, build and test the robots directly in the fields of our own pixelfarm and other fields.

Private funding
8 Million

Founded in
2019

Almkerk
Noord-Brabant

A team of
25 people

10 hectares
of test fields

Our purpose

We believe in healthy food from healthy soil. With Robot One we want to offer growers a way to realize this dream.

**We empower growers to become gamechangers in modern agriculture.**

Built by our Engineers

Supported by farmers

Over the years we have gathered a diverse team of young professionals and engineers. Ranging from AI specialists to mechanical engineers and from designers to software engineers, we have everything in house to create robots. However, when building a Robot for the future generation of farmers, you do need to work with farmers.

During our development we have come to know a wide variety of innovative farmers. Some just a few kilometers away and some overseas in North America. They share their knowledge on how they farm and on how the want to farm.

Our team together with these farmers form a community that aims to improve the Robot One and make it operable for any farmer. We challenge ourselves daily to create robots for the future generation of farmers.
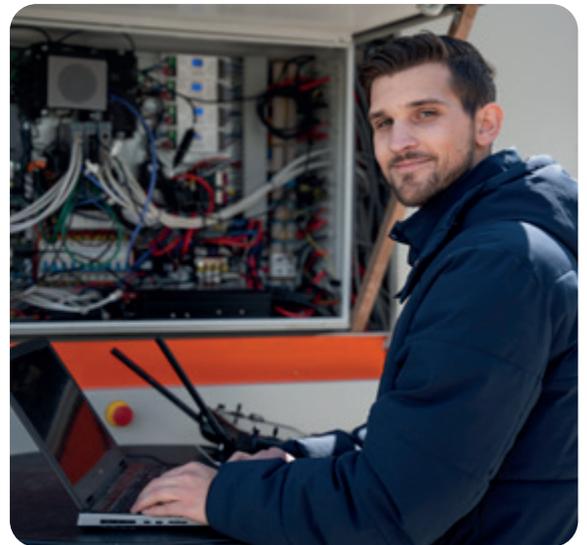
Sharing knowledge and building communities

We are building a global network of Robot One users. At the heart of this network are the HUBs, where forward-thinking farmers work with the technology of the future.

What is a HUB?

At a Pixelfarming Robotics HUB, interested parties can get business ideas, see Robot One in action and follow (parts of) the onboarding program. Joint actuators can be developed, and education plays an important role.

There is always one Robot One at a HUB, and the owner is preferably a crop specialist. By collaborating in working groups, crop-specific problems can be rethought using robotics and AI. New solutions can be tested and turned into projects. Perhaps with opportunities for grants or other financial support.

New revenue model

Offering an onboarding program is an additional revenue model, as is the use of digital growth models. This is all about sharing knowledge. You will experience the format for yourself during the onboarding programme when you buy your own Robot One. Let the farm become the new robotics school! Pixelfarming Robotics will help you.

Dealerships

In some cases, a HUB is combined with a Pixelfarming Robotics dealership. You can go there for parts, service, and support. As a dealer, you give demonstrations, guide new users during the onboarding program, and help them get the most out of Robot One. You share practical experiences with other HUBs and contribute to the ongoing development of knowledge and technology within the network.

Your company as a HUB?

We expect you to be innovative and to think about the social and societal aspects of future growth. You communicate clearly, enjoy working with like-minded people and are proud to show off your robot and company. Pixelfarming Robotics will help you to establish your company as a hub and attract market attention. But it all starts with choosing Robot One!

We believe in robotic technologies in agriculture. Pixelfarming Robotics was founded in 2019 to support the robotics transition in agriculture. We design and manufacture advanced agricultural robots to support regenerative and biodiverse farming.

Pixelfarming Robotics

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