

Press release

digital workbench gmbh, from southern Germany, presents the Tipard 350, an advanced robot platform for agricultural applications

Featuring sophisticated driving and steering technology, an innovative module architecture, superb maneuverability and autonomous movement in the field



Wettstetten, Germany, January 2023. In June 2022, the agricultural technology market saw the successful launch of the Tipard 350, the first autonomous robot carrier platform produced by family-run technology company digital workbench from southern Germany. The main focus during the two-year development period was on meeting customer requirements for plant breeding, agrochemical and highly specialized agricultural applications. This all-terrain vehicle provides users with

an innovative robot, whose versatility across all kinds of agricultural application is nearly limitless, and yet the machine is extremely user-friendly. Its stand-out features are the sophisticated driving and steering technology, its incredible maneuverability and autonomous movement in the field as well as its modular architecture, which give the customer maximum flexibility in deploying the Tipard 350. Users also benefit from the pioneering approach the company is taking in agricultural robotics. Case in point: development of the second generation Tipard 350 is already underway. Currently, the first devices for harvesting and control agent application are being developed in-house, which can be easily integrated into the platform's system. In these projects, digital workbench closely collaborates with German universities, just as they have previously done when developing the Tipard 350 itself. One of the first customers is the renowned Weihenstephan-Triesdorf University of Applied Sciences in Weidenbach, Bavaria, who uses the Tipard 350 for research applications like automated phenotyping in plant populations.



Benefits of the Tipard 350

One of the most surprising features of the Tipard 350 is its low weight compared to the otherwise quite generous dimensions. Its exceptional maneuverability, ample clearance and self-leveling chassis make the Tipard 350 highly reliable in the field. Where the Tipard 350 really shines, however, is through its innovative and flexibly expandable modular architecture. Like no other device, it facilitates integration of proprietary applications through open-source hard- and software

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interfaces. Smart technology and other high-tech features take user-friendliness and adjustability to new heights:

- Intuitive controls and easy-to-use manual steering
- 3D camera-controlled steering
- Precise self-localization and direction recognition via a dual-RTK GNSS receiver
- No HV limitations when working with the machine
- Autonomous drive mode even in difficult terrain
- Battery or range extender power supply
- Self-leveling chassis
- Vibration-free electronics carrier with air-to-air heat exchanger



“In our experience over the years, it is predominantly the highly specialized segments of the agricultural sector that are looking for automation solutions. We are meeting this demand with our new all-terrain carrier vehicle, the Tipard 350. Its modular architecture and, consequently, universal usability offers well-nigh limitless possibilities especially for automated data collection. Each robot we produce is one of a kind because we develop and manufacture each one in close consultation with the customer and their particular needs,” says founder and CEO Josef Schmidt.

Limitless possibilities out in the field

Out in the open field is where the all-terrain carrier platform Tipard 350 really shines. The compact, nimble and light-weight robot easily maneuvers through any root or cereal crop field like soy, wheat, sugar beet or potatoes and carries out its job autonomously. Depending on the customer's particular needs, the height, length and width of the vehicle can be adjusted and individual features and applications customized. The current model features an adjustable clearance of 0.5 to 0.8 meters, making adapting to changing terrain and different crops easy. The standard loadout includes a hydraulic self-leveling chassis. If needed, the controller can also manually adjust both clearance and leveling (both length- and crosswise). The Tipard 350 achieves maximum maneuverability thanks to 360° turning wheels. Multiple steering regimes like Ackermann, 4-wheel, and crab steering as well as on-the-spot turning make this flyweight an incredibly maneuverable carrier vehicle capable of reaching even the most difficult-to-access spots. Despite its very sturdy construction, the robot weighs in at a mere 350kg with an optional load of 150kg. Even in tight and narrow spaces inside buildings or halls, the Tipard 350 remains extremely maneuverable. In addition, the easily adjusted axle track makes the machine even more versatile. The robot is already being used as a trial platform, e.g., for automated collection of soil samples.

Modular architecture makes flexible deployment a cinch

The Tipard 350's innovative modular architecture is supported by a standardized backbone structure. Thanks to open-source hard- and software interfaces, it is easy to integrate custom applications or the customer's IT infrastructure into the system, taking flexibility and customizability to another dimension. On top of that, the entire mechanical superstructure can be tailored to the customer's needs in length, width and height.

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Use case: plant breeding

The autonomous carrier platform allows flexible and easy automation of crop inspection and evaluation runs. The necessary flexibility for this automation is provided by the variable axle track and clearance, the freely adjustable telescopic axles and the hydraulic chassis. Another unique feature is the immediate availability of a second axle track by simply turning the wheels 90°, allowing easy toolless reorientation of the machine. The hydraulic passive chassis leveling makes for a perfectly smooth ride always keeping sensors and imaging equipment aligned perfectly parallel to the ground. This facilitates 24/7 autonomous data collection, saving customers valuable time and resources. Captured data can be sent via a stable wireless connection directly to the plant breeder's database where it can be accessed in real time.

About digital workbench GmbH

Based in Wettstetten, Bavaria, digital workbench gmbh offers customers in the robotics, environmental, manufacturing and automotive industries start-to-finish product development from one single supplier. The service portfolio encompasses everything from granular project planning to manufacturing in the company's own workshop. Supported by ISO 9001-certified quality management and a proprietary project management framework, digital workbench gmbh offers custom solutions for construction, hard- and software development and manufacturing. The family-run business also offers prototyping and a high-tech pre-compliance testing lab. Originally established in 2014 as an automotive electronics supplier by owner and CEO Josef Schmidt (37), digital workbench gmbh never ceased to be passionate about and fully committed to digital technology. The company has successfully leveraged their extensive expertise in network architecture, sensor technology, LoRa technologies and other related fields for applications in the robotics, environmental and manufacturing industries. The company also maintains close research and development collaborations with renowned mechanical engineering companies and several Bavarian universities.

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