

PRESS RELEASE

Driverless in the field: Agriculture companies KRONE and LEMKEN rely on software from Apex.AI for autonomous farming machines

- The high-performance Apex.AI development environment enables the prototype functions developed by KRONE and LEMKEN to be transferred to safety-certifiable products
- KRONE and LEMKEN use Apex.Grace and Apex.Ida from Apex.AI to further develop the 'Combined Powers' project, an autonomous drive vehicle and attachments that can take on various field work
- The collaboration strengthens agile software development in the partner companies KRONE and LEMKEN

Palo Alto, California / Alpen, Spelle, Germany, August 30, 2023 — [Apex.AI](#), a company that develops safety-certified software for mobility and autonomous applications, announced today a joint product development project for commercial-ready autonomous farming systems with [KRONE](#), a manufacturer of agricultural machinery and precision agricultural technology, and [LEMKEN](#), a company that manufactures innovative machines for tillage, sowing and sustainable plant care. The '[Combined Powers](#)' concept vehicle, which was developed by KRONE and LEMKEN, is an autonomous drive unit that acts as a smart system that can plow, cultivate, sow, mow, turn and swath. The companies are now transitioning the concept carrier vehicle from the prototype stage to series production by leveraging Apex.AI's Software Development Kit (SDK), consisting of Apex.Grace and Apex.Ida.

The commercial-ready 'Combined Powers' vehicle, which has already proven its performance in the fields, will save farmers valuable time in the future while maintaining the precise quality of work. There is a shortage of skilled workers in agriculture as in many other sectors. Therefore, farmers are increasingly relying on digitization and automation in order to make optimal use of the available work capacity and are increasingly leveraging

innovative technology including robots that assist in livestock breeding or machines that work the fields highly autonomously.

Key software functions of the 'Combined Powers' architecture are based on the Robot Operating System ROS, making it a logical decision to rely on Apex.AI products, which are also based on ROS. Unlike ROS, however, Apex.AI's products are certified by TÜV Nord for applications with special functional safety requirements and are therefore suitable for commercial vehicle use. Due to the compatibility, the data obtained with the prototypes can be used directly in series development. This makes the Apex.AI software the ideal core component for the further development of the 'Combined Powers' products into series production.

"Apex.AI is establishing an operating software for the autonomous age. The partnership with KRONE and LEMKEN is a win-win for all parties: Our development environment, consisting of Apex.Grace and Apex.Ida, is the perfect basis for the applications of KRONES and LEMKEN's carrier vehicles. We are now working closely with both companies on a first project to familiarize the teams from the agricultural technology manufacturers with the suitability for series production and the possibilities of the Apex.AI products and methods. We will also evaluate our software as the framework and middleware solutions as part of the implementation phase of the VTE concept," explains Jan Becker, CEO of Apex.AI.

"In working with Apex.AI, we see the opportunity to move from a development solution based on ROS and ROS 2 to a series solution based on Apex.Grace and being able to implement secure functions," explains Manuel Volk, developer at KRONE, the partnership with Apex.AI, "I also expect a faster learning curve in the company, since many developers are familiar with the concepts and tools of the Apex.AI SDK from their previous work with ROS and ROS 2."

"Apex.AI enables us to develop applications that are largely independent of the hardware used. This accelerates the development process and reduces complexity." Michael Nienhaus, a developer at LEMKEN, explains the collaboration.

Apex.AI, a US company with German roots, is specialized in the development of operating systems for autonomous vehicles and has extensive knowledge in the fields of robotics and artificial intelligence. Various partners in the agricultural and automotive world (e.g., [AGCO](#),

Volkswagen [MOIA](#)) are already benefiting from the experience. Apex.AI's agile and iterative software development kit (SDK) enables customers to significantly increase the speed of software development and is tailored to individual applications.

About Apex.AI

Apex.AI is an international developer of safety-certified base software, enabling a faster transition to software-defined vehicles and software-defined mobility. The company's software products are based on proven open-source software, such as ROS or Eclipse iceoryx. Through a proprietary process, we add what is necessary to support commercial and safety-critical applications such as functional safety, real-time determinism and flawless performance. The company's headquarters is located in Palo Alto, CA, USA, with offices in Berlin, Munich, Stuttgart in Germany, Gothenburg in Sweden, Tokyo in Japan and Pangyo in South Korea. To date, Apex.AI has raised over \$75 million USD from world-class venture, financial and strategic investors including [AGCO](#), [Airbus Ventures](#), [Canaan](#), [Continental AG](#), [Daimler Truck](#), [HELLA Ventures](#), [Jaguar Land Rover's InMotion Ventures](#), [Lightspeed](#), [Orillion](#), [Toyota Ventures](#), [Volvo Group Venture Capital](#) and [ZF](#).

Find the Apex.AI Media Kit here: <https://www.apex.ai/media-kit>.

About KRONE

The KRONE group, with its headquarter in Spelle, Germany, offers intelligent and sustainable solutions to the challenges posed by the megatrends of food supply and transportation. The family-owned business is a market leader in both business areas. The flagship products include the self-propelled high-performance mower conditioner BiG M and forage harvester BiG X. KRONE machines are currently operated in more than 60 countries globally.

Also broadly diversified is the product portfolio in the commercial vehicle segment ranging from semitrailers over refrigerated trailers to container chassis and the e-cargo bike Rytle. KRONE offers applicable solutions for all transport tasks with quality, ecology and economics.

About LEMKEN

LEMKEN is regarded throughout the world as a visionary and sustainable company that makes an important contribution to profitable agriculture. As a company with a long tradition, we have been applying our knowledge and passion for progress for 240 years. LEMKEN has its finger on the pulse of development and delivers smart solutions for the agricultural challenges of today and tomorrow. The interviews and pictures from the various divisions show what drives LEMKEN and how we meet the farmer's demand for quality and innovation.

Press contacts

Apex.AI

US: Stacy Morris, stacy.morris@futuristacommunications.com, +1 310 415 9188

Europe: Christian Bangemann, christian.bangemann@apex.ai, +49 171 8398418

Korea: Desiree Park, desiree.park@apex.ai

Japan: 横井 マリ, mari.yokoi@apex.ai, +60 17 389 4304

KRONE

Markus Steinwendner

Head of Marketing KRONE Agriculture

+49 5977 935 188 20

markus.steinwendner@KRONE.de

www.KRONE.de

LEMKEN

Marie Ehse

LEMKEN Marketing

+49 2802 81250

m.ehse@LEMKEN.com

www.LEMKEN.com