

An aerial view of a yellow autonomous tractor operating in a field. The tractor is positioned in the lower right quadrant, moving towards the upper left. It is surrounded by a series of blue, semi-transparent sensor beams that radiate outwards, creating a grid-like pattern on the ground. The tractor itself has a blue dot on its side, likely representing its current position or a target point. The field is dark, and the overall scene is illuminated with a cool, blue-toned light, suggesting a high-tech or futuristic agricultural environment.






5 WAYS AGRICULTURE
BENEFITS FROM
DURO'S PRECISE
POSITIONING

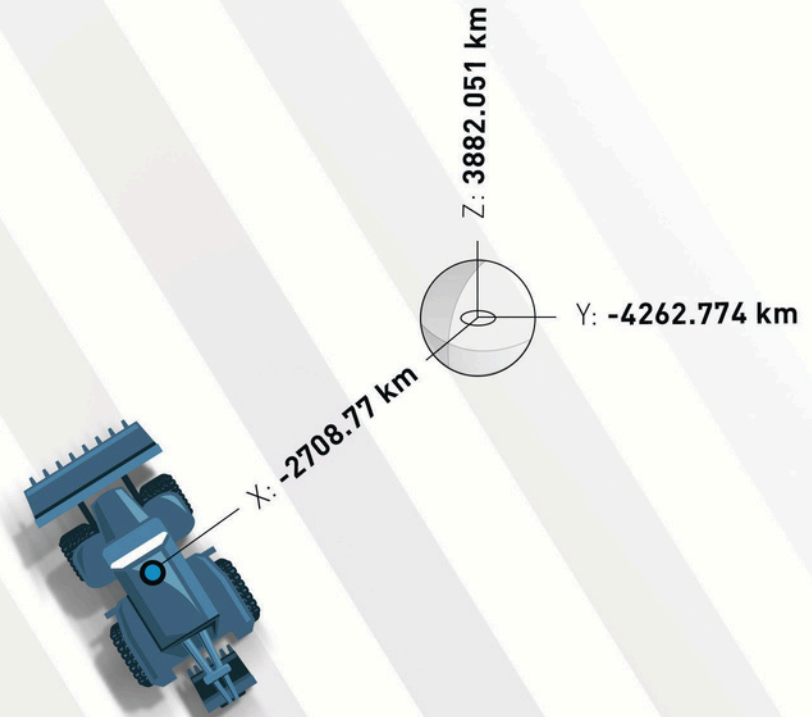
5 WAYS AGRICULTURE BENEFITS FROM SWIFT'S PRECISE POSITIONING

Today's agricultural applications must operate at maximum efficiency to meet the growing demands on available land and of required yields. By utilizing advanced positioning technology as part of agricultural applications, farmers and agricultural operators can automate equipment and automate tasks to ensure the future success of crops.

Precise positioning technology utilizes the global navigation satellite system (GNSS)—of which GPS is part—as a component of a sensor network to guide equipment, making Duro's Navigation's specific ecosystem of precise positioning GNSS solutions ideal for agricultural applications. By utilizing the easily integrated Starling® positioning engine, the ruggedized Duro® and Duro Inertial receivers or connecting your existing receivers to receive precision corrections from RTK, operators can automate equipment and improve efficiency with reliable, accurate positioning.

This e-book explores five ways that Precise Positioning from Duro's Navigation benefits agriculture:

-  **Achieves the accuracy your crops require**
-  **Easily automate existing equipment**
-  **Delivers reliable positioning you can count on**
-  **Ensures equipment operates where intended**
-  **Is cost effective**



#1 | **PRECISE POSITIONING ACHIEVES THE ACCURACY YOUR CROPS REQUIRE**

Precise positioning improves on what we historically accept from location data to identify the position of equipment well beyond the standard location data accuracy of 3 meters and provide positioning at centimeter-level accuracy. Standard GNSS solutions can indicate that you are in the correct area of a field but with corrections delivered by RTK (real-time-kinematic), you can be certain equipment is operating in the right row, exactly where a planting needs to occur and can identify areas along the edge of crops that should be avoided.

This high-level of accuracy improves efficiency in fields through the automation of repetitive tasks like weeding and pest control, allows the implementation of autonomous tilling, spraying, planting and harvesting to boost crop yields and overall productivity.



#2 | **PRECISE POSITIONING CAN EASILY AUTOMATE EXISTING EQUIPMENT**



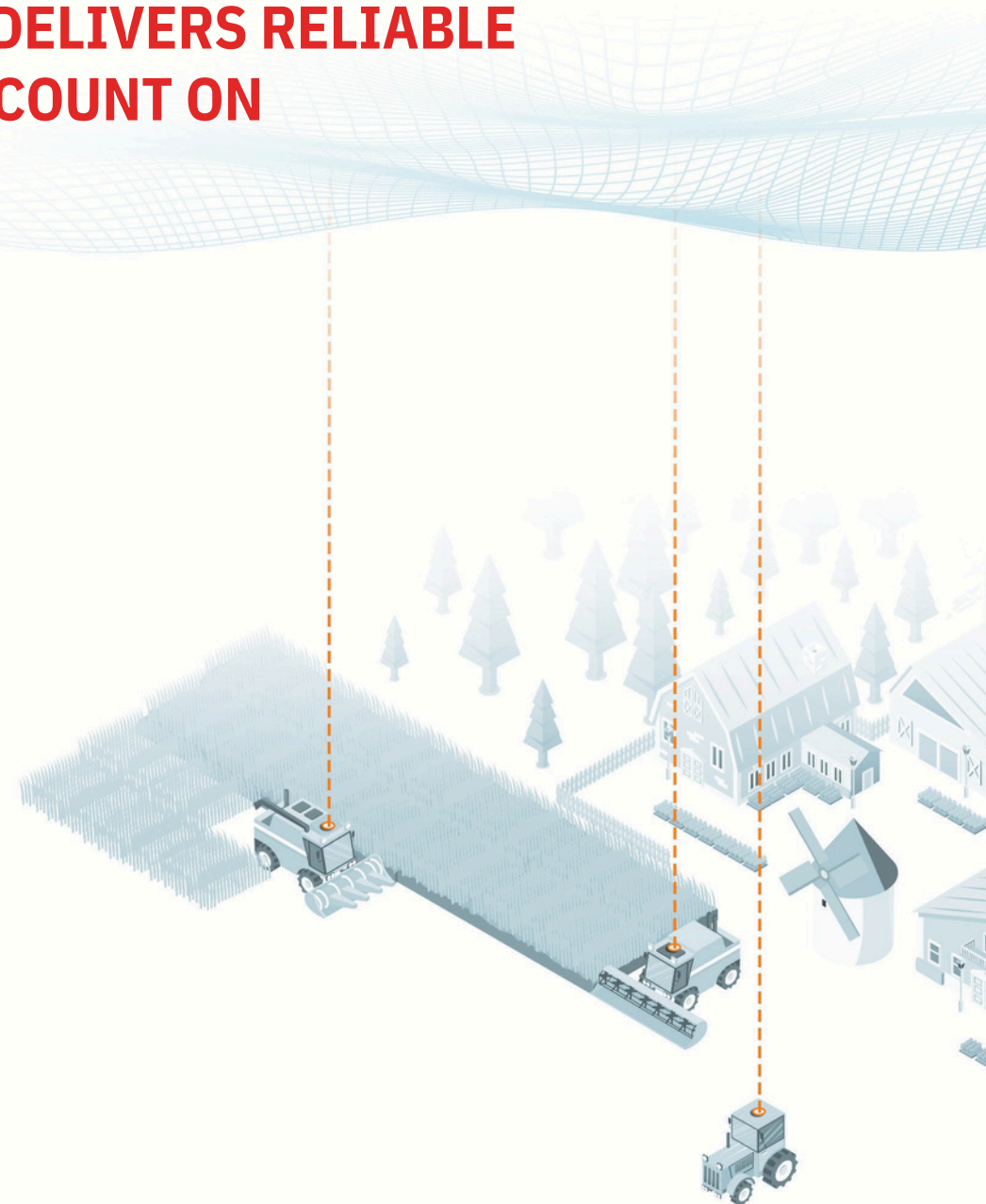
We know that a one size fits all approach does not make sense for agricultural applications. Precise positioning makes it easy to automate existing equipment and offers an end-to-end positioning and automation solution that can be built into navigation systems or added to equipment as an aftermarket capability to allow the implementation of both partially and fully autonomous or remote-monitored automation.

Duro offers a variety of hardware options, including a ruggedized receiver that can withstand moisture, vibration, dust, water immersion and the unexpected that can occur in outdoor long-term deployments. Pair existing GNSS receivers with RTK and benefit from high-precision corrections via the cloud across continents, making it possible for your equipment to easily connect to and benefit from high-accuracy, no matter where fields are located.

#3 | **PRECISE POSITIONING DELIVERS RELIABLE POSITIONING YOU CAN COUNT ON**

High-accuracy is one of the most important elements of precise positioning, however reliability is what makes it critical to agricultural applications. Reliability is the confidence in the position and velocity provided by the positioning system and precise positioning delivers reliable, seamless location data by utilizing the cloud to deliver corrections via cellular signals.

Duro's network of reference stations—in operation across the globe—accounts for errors (both environment and atmospheric) that come from satellite signals and sends them to the precise positioning service that calculates detailed corrections and sends them down to the user via an Internet connection. RTK utilizes this network to deliver centimeter-level accurate corrections, along with other applicable sensor inputs, to produce a dependable and definitive position for that piece of equipment.

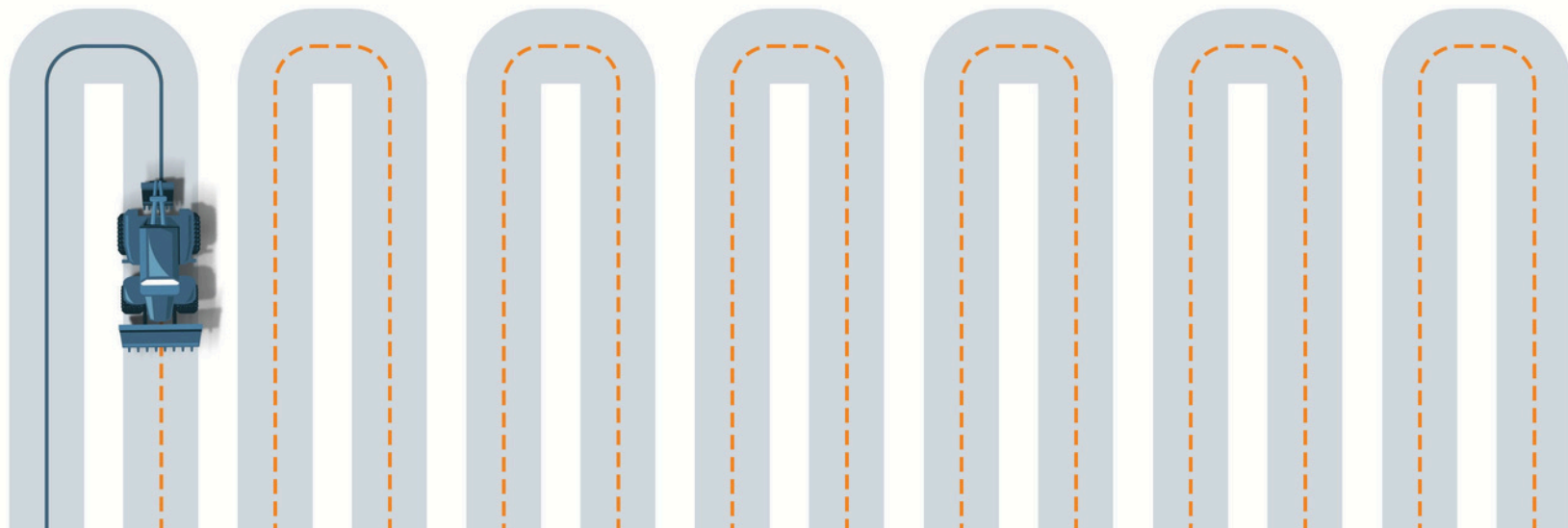


#4 | **PRECISE POSITIONING ENSURES EQUIPMENT OPERATES WHERE INTENDED**

The accuracy delivered by precise positioning is what makes automated equipment operation possible. The implementation of geo-fencing capabilities to ensure equipment operates within its designated area is only as dependable as the positioning used. With precise positioning you can be confident in the accuracy and reliability of positioning signals so that equipment will operate where intended and when intended.

The confidence gained in the position and operation of equipment also adds to increased efficiency and safety. Precise positioning makes it possible to automate tedious, labor-intensive and repetitive tasks to reduce user fatigue and optimize land use by making it possible to continue operation in low light / poor visibility conditions.

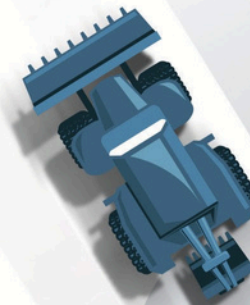
Equipment can also proactively avoid collisions with underground or unseen infrastructure, such as irrigation systems.



#5 | **PRECISE POSITIONING IS COST EFFECTIVE**

Historically, cost was the primary barrier for the implementation of high-precision GNSS into agricultural equipment. Utilizing years of GNSS experience, Duro has demonstrated that accurate positioning technology can be affordable by offering a highly competitive end-to-end positioning and automation solution. Duro's precise positioning solution does not require the purchase of expensive hardware, though Duro does offer hardware solutions at a fraction of the price of legacy systems. The savings compound when you factor in improved operating costs and efficiencies gained.

When you utilize RTK to bring RTK corrections to your existing GNSS receivers, you save by automating existing equipment, eliminating the need for base station installation and subscribing to the service with no fixed contract.



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THE CRL TEAM IS HERE TO
HELP YOU EASILY
IMPLEMENT PRECISE
POSITIONING INTO YOUR
EQUIPMENT!

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