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Case Study
Precise Positioning

We have developed an autonomous robotic lawn mower for large terrains. For our lawn mower, Precise Positioning provides markedly better results when compared to the standard GNSS solutions, which can be utilized to solve many robotic problems."

Joan Kangro, CEO Kingdom Technologies

Improving Industrial Lawnmowers

Kingdom Technologies specializes in large terrain robotic lawnmowers. Since its founding in July 2018, it has become one of the fastest-growing robotics startups in Scotland. Kingdom has been awarded grants from start-up competitions like Smart:Scotland or Early Stage Growth Challenge and has raised over £800,000 in funding from private investors and public funds.

The Challenge

Robotic lawnmowers have several challenges to overcome. Firstly, they generally move randomly, they either miss spots or move over the same spot repeatedly. They require boundary cables to fence off the area of work. The length of the required boundary cable limits the work area for the robot and increases costs associated with purchasing required cables and the labor involved in setup and installation.

The Solution

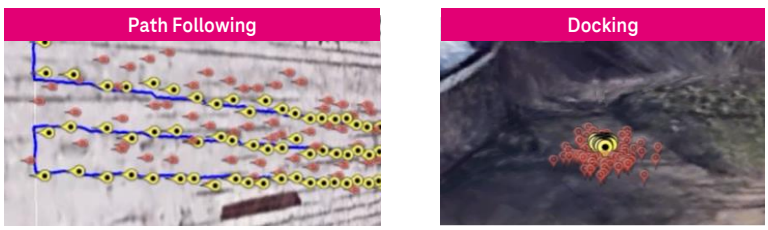
Kingdom Technologies installed both a standard GNSS receiver and the PGM Evaluation Kit, which uses GNSS corrections from the Skylark cloud-based, Precise Positioning service to improve GNSS accuracy, into its robot lawnmower to compare their performance. With the hardware in place, they conducted an initial, standard path following test. The second test was conducted to analyze the docking features of the robot.

The Result and Next Steps

The results for both tests showed that with the PGM Evaluation Hardware, the performance of the Kingdom lawnmower significantly improved. In the path following test, the bias of standard GNSS was greater than 50cm where Precise Positioning solution resulted in a bias of less than 5cm, which is extremely useful for the effective work completion by the robotic lawnmower, the closer it is to its defined perimeter the more likely it is that the area to be covered is completed without too many deviations. When docking the robot in the surveyed charging station, Precise Positioning showed similar superiority over standard GNSS solution.

Figure 1: PGM Receiver, 50.95 x 30 mm Mini PCIe

Figure 2: PGM Evaluation Hardware 115 x 82 x 34 mm



Comparison of standard GNSS and Precise Positioning setups in path following and docking test setups,
Red points – standard GNSS Positioning
Yellow points – Precise Positioning

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T swift NAVIGATION

Watch Kingdom Technologies' view on Precise Positioning here

Contact
For more information,
contact your
Precise Positioning Sales Specialist:
PrecisePositioning@telekom.de

Publisher
Deutsche Telekom IoT GmbH
Friedrich Ebert-Alle 71–77
5313 Bonn, Germany
www.iot.telekom.com