Robotic Mowers: Wireless Communication, AI and Machine Learning at Work

Digi Embedded Solutions Drive Automation in Robotic Vegetation Management

Challenge

In large utility fields — such as solar farms — managing weeds and grasses is important to ensure equipment is not hindered by undergrowth, and that personnel can access the installation for routine maintenance or repairs. These deployments can cover many hundreds of acres, which means an industrial mowing solution is crucial. Renu Robotics set about solving the issue, while also seeking to reduce the carbon emissions involved in industrial mowing.

Solution

The company developed Renubot — an autonomous electric robotic mower — as well as a recharge pod and mission control center to manage the mowers. Renubot incorporates wireless communications from Digi XBee® PRO 900HP embedded communication modules, as well as AI and machine learning, Velodyne lidar sensors, real-time kinematic GPS positioning navigation, and powerful batteries for extended performance.

The Digi XBee PRO 900HP module integrated into each robot connects wirelessly via the DigiMesh® networking protocol. The modules support RF line-of-sight ranges of up to 28 miles making them ideal for extended-range applications across wide geographic areas. The mesh networking protocol enables the rapid transfer of navigational correctional data from the base station to the fleet of mowers. When the Renubot mowers return to their charging pods, they receive updated scheduling information and routes.

Outcome

The autonomous mowers save operational costs and improve efficiency, while massively reducing carbon emissions, compared to fuel-based mowers. Renubot systems typically save solar and energy facilities 30-50 percent compared to their current costs, and enable them to scheduling mowing at night to optimize schedules. Additionally, there is a safety outcome, reducing accidents and injuries for grounds crews.

> "The Digi XBee 900HP PRO has been an excellent solution for the communications component of our solution. We are especially happy with its mesh-networking capability, easy integration, and the range of frequencies supported. Since our implementations can span hundreds of acres, we wanted a choice of radio frequencies to support longer distances." —Michael Blanton, chief technical officer of Renu Robotics

For more information, visit:

www.digi.com

877-912-3444 | 952-912-3444

 91004651 A1/1023