

# PRECISION AGRICULTURE WIRELESS TECHNOLOGY

## Optimize Efficiency and Reduce Costs

Precision engineering changes the way farmers manage crops, control pest infestations, take soil samples, and irrigate fields. Driven by Global Navigation Satellite Systems (GNSS), Global Positioning Systems (GPS), and wireless technology; precision agriculture advancements continue to improve crop yields, maximize operational efficiencies, and support cost-effective farming.



### Field mapping

uses GNSS to record and map the locations of rocks, potholes, power lines, poorly drained fields, pest infestations, and field fertility variations.



### Tractor swath path optimization

applies GPS to automate parallel tracking for improved operator efficiency.



### Soil moisture and irrigation sensors employ

GPS wireless technology to record moisture levels, so farmers can automatically measure, gauge, and redistribute water without manual field inspections.



### Crop yield improvements

leverage GNSS and GPS wireless data transfer technology to manage strip-till furrows, control seed usage, and minimize double planting; making farms more efficient.

## Antenna Considerations

Antennas are key to accurate and successful implementation of wireless solutions for today's modern farms.

- **Differential correction** uses a dual-band GNSS system to mitigate the slightest errors in GPS locations caused by signal delay, multipath, satellite orbit, or timing synchronization discrepancies.
- **GPS references** accurately pick up at least three separate satellites to triangulate latitude and longitude positions plus a fourth satellite to determine elevation.
- **Multiband frequencies** and GPS in a single radome are ideal for rovers that need to communicate with a reference base station located within five miles.
- **Low noise characteristics** prevent the GPS antenna from interfering with other on-board system communications.
- **Rugged design** minimizes exposure to harsh chemicals, diesel fuel, axle grease, and petroleum-based products that eat away at rubber compounds.
- **Environmental testing** ensures optimal performance during vibration, extreme temperatures, and agrochemical exposure.

## Antenna Solutions

PCTEL® offers a wide variety of antennas to meet your specific requirements.

### 8117D Elevated Feed Antennas

relays satellite positioning information to the management center and receives the differential signal from the base station BOA series antenna to improve accuracy at the sub-meter level.



### Omnidirectional BOA Series Base Station Antennas,

placed with a GPS-TMG antenna at a silo elevator or distribution station improve communication accuracy.



### GNSS-L125-TNC Antennas

achieve pinpoint accuracy with redundancy in positioning, which mitigates errors caused by multipath.



### GPS L1L2 Frequency Band Antennas

acquire signal lock on 8-9 satellites for improved location accuracy.



**1270FW Series Antennas** are designed to meet DO-160 standards for airborne equipment. The ARINC 743 form factor is robust, with a hermetic seal for long-lasting, trouble-free deployment and durability.



**8111D-HR Antennas** minimize harmonic interference caused by adjacent antenna propagation, keeping a higher number of satellites in lock with the GNSS1 constellation to improve receiver accuracy.



**4G LTE Heavy-Duty Mobile Antennas** have a rugged, flexible design for high-vibration or high-impact applications, both mobile and fixed.



### GL124DLTEMIMO-SF Antennas

can be used as mobile or fixed omnidirectional installations with full multi-GNSS compatibility covering global GNSS systems.



## Solving Complex Wireless Challenges

PCTEL is a leading global provider of wireless technology, including purpose-built Industrial IoT devices, antenna systems, and test and measurement solutions. Trusted by our customers for over 25 years, we solve complex wireless challenges to help organizations stay connected, transform, and grow.

Learn how to maximize your agriculture operations with robust, industrial-designed antennas at:

[pctel.com/agriculture](https://pctel.com/agriculture)



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