

# Crop Circle Model ACS-214



The Crop Circle ACS-214 active optical sensor (AOS) calculates the NDVI vegetation index as well as measuring canopy height via integrated radiometric, LIDAR and ultrasonic sensors.

Unlike passive radiometric light sensors, the Crop Circle ACS-214 is not limited by ambient lighting conditions – measurements can be made day or night due to its unique, active sensing technology.

For on-the-go applications, the Crop Circle ACS-214 sensor can be mounted to virtually any type of vehicle to remotely sense and/or map plant or crop canopy biomass while driving through a field. Information produced by the sensor can be utilized to quantify the impact of nutrients, water, disease or other growing conditions on plants or crops.

## 3D NDVI MEASUREMENTS

The ACS-214 integrates three measurement instruments into one compact sensor package. The sensor simultaneously measures crop/soil reflectance and sensor-to-crop distance. A unique feature of the ACS-214 sensor is its ability to make 3D NDVI measurements: an industry first. The sensor accomplishes this by assessing the approximate height of the plant canopy utilizing reflected NIR radiance, LIDAR and ultrasonic range detection. The height measurement can then be used to scale the NDVI measurement or create robust biomass models. This new measurement technique helps to reduce the saturation effect often encountered when using the classic NDVI measurement instruments at high biomasses.

## COLLECT DATA EASILY

Using the Holland Scientific GeoSCOUT X datalogger, data can be easily and quickly recorded. Geospatial sensor data are stored on an internal SD flash card. All recorded data are saved using a comma-separated-variable text format for easy import into third-party GIS mapping and analysis software.

## FEATURES:

- » Multi-sensor integration: AOS, LIDAR and SONAR
- » 3D NDVI measurement
- » Make measurements day or night
- » Measurements not influenced by fluorescent or other AC light sources
- » Wide measurement range — 25 cm to 200 cm
- » Rugged—dust and water resistant
- » Low noise performance
- » Fast data output rate
- » Low power operation

## SPECIFICATIONS: (Preliminary)

**Sensor-to-Canopy Range:** Typically 10 in (25 cm) to over 79 in (200 cm)

**Field-of-View (AOS):** ~40 degrees by ~10 degrees

**Field-of-View (LIDAR):** <4 degrees

**Field-of-View (SONAR):** <10 degrees

**Active Light Source (AOS):** Modulated polychromatic LED array

**Photodetection (AOS):** Two channel silicon photodiode array

**Optical Measurement Bands (AOS):** 670 and 780 nm

**LIDAR Light Source:** Modulated monochromatic laser diode

**LIDAR Detection:** Time-of-Flight (TOF) via silicon photodiode

**Ultrasound Sensor:** 112KHz pulse-echo

## ELECTRICAL SPECIFICATIONS

**Sample Output Rate:** 5 samples per second

**Operating Range:** 0 to 50 °C

**Communication Interface:** RS-485 multi-drop

**Power:** 11 to 16.5V DC @ ~300 mA

**EMC Certifications:** TBD

## MECHANICAL SPECIFICATIONS

**Enclosure:** Injection molded polycarbonate

**Environmental:** IP54 for dust and water resistance

**Weight:** 1.0 lb (454 gm)

**Sensor Mount:** (2) M6 X 1 threaded holes in base of sensor spaced 1.25 in (3.2 cm)

**Dimensions:** Width 3.5 in (8.9 cm), Length 7.9 in (20.1 cm), Height 2.2 in (5.6 cm)

**Serial/Power Connector:** 12-pin Deutsch, O-ring sealed

## ACCESSORIES AND SYSTEM PACKAGES

**Crop Circle ACS-214 Mapping System includes:** Crop Circle ACS-214, GeoSCOUT X, cables, storage case, mounting plate and user's guide

*Specification are subject to change without notice.*

## NOTES:



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