CI-110 Plant Canopy Imager

CID Bio-Science Inc.

Portable Instruments for Precision Plant Measurement

Fast, Accurate and Non-Destructive Measurements of Leaf Area Index (LAI)

The CI-110 mesures Leaf Area Index (LAI) using two independent methods: Gap fraction or PAR analysis. It provides real-time canopy images with LAI and instant photosynthetically active radiation (PAR) readings. Data is collected using a hemispherical camera and a ceptometer equipped with 24 photodiodes. Simply place the probe under or in the plant canopy to make a measurement.

The plant canopy imager captures and downloads those images then calculates a full complement of PAR and LAI data on an included handheld computer. LAI is estimated from images and radiation measurements using the 24-PAR wand. The underlying theories for both analysis methods have been validated, published, and accepted by canopy researchers.

✔ Complete Picture

Multiple canopy and environmental parameters captured with each measurement

✔ Simple Operation

Easy to collect, capture, and process measurements

✔ Comprehensive

LAI calculations can be generated from Gap Fraction analysis or PAR analysis

Computer & Software Package

The new and improved CI-110 Plant Canopy Imager now ships with a compact handheld computer (call for details) loaded with a software package that has been designed and optimized for a touch screen. The new software is fast, powerful and easy to use.

Package Details

- **Touch screen tablet computer**
- **Wi-Fi compatible**
- **GPS tags for each measurement**
- **Digital masking of unwanted objects**
- **Images saved in multiple formats**

Data and Calculations

- Permanent canopy image record
- Leaf Area Index (LAI)
- Mean Leaf Inclinations
- Photosynthetically Active Radiation (PAR)
- Canopy Transmission Extinction Coefficients
- GPS and compass coordinates
- Direct transmission coefficient for user specified zenith angles

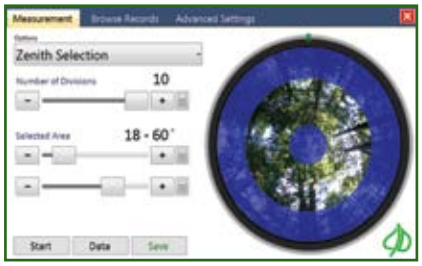
Data Transparency

With each data point sampled, the CI-110 preserves the orginal Raw Image, PAR Sensor Readings, and Calculated Data and further tags each data record with the calculation parameters, instrument parameters, time, date and GPS location.

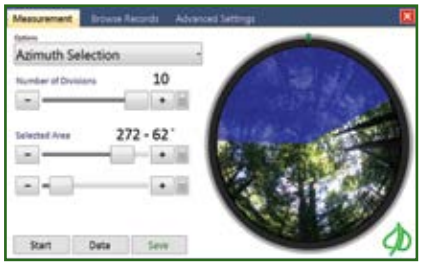
Gap Fraction Analysis

Gap fraction analysis is the standards-based mathematical analysis of gaps in the fisheye canopy image used to determine foliage density, leaf angle distribution and Leaf Area Index (LAI)*. CID uses the Norman and Campbell** tested methodology for gap fraction analysis to estimate LAI.

Zenith Angle



Azimuth Angle



Sky Conditions

Measurements can be taken in any sky conditions, even if the light changes during the sampling. The CI-110's optical filter ensures that scattered radiation does not affect the sensor by restricting radiation above 490 nm. This minimizes the effect of light scattered by foliage (Welles, 1990), which allows for accurate measurements of LAI from below or within the canopy under varied light conditions. Users may also easily determine the most accurate threshold setting for their research purposes and adjust software settings accordingly.

Advanced software takes the place of legwork with the CI-110 compared to other instruments that rely on automated light/dark threshold calcuations and may require the difficult task of sampling both above and below the tree canopy or restrict your research to overcast days. With advanced technology, the CI-110 takes the burden out of your field research.

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Specifications

CI-110 Specifications

Lens	Self-leveling Hemispherical Lens
Image Resolution	180,956 pixels
Interface	USB
Mesuring Time	0.5-1 second
Fish-eye Lens Angle	150˚

Probe Size	42 x 72 mm
Arm Length	440 mm
Probe and Arm Weight	o.45 kg
PAR	24 PAR sensors, 10 mm spacing
Operating Temperature	5 to 50 ˚C

Application References

From agronomy to forestry and environmental science, the CI-110 Plant Canopy Imager has been proven to be an effective instrument creating useful data sets for researchers worldwide. For information about applications, please refer to the references below, or visit www.cid-inc.com/publications.

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