



CCM-200 *plus*



Chlorophyll Content Meter

A lightweight hand-held device for the accurate and easy determination of chlorophyll content

- ◆ Non-destructive
- ◆ Accurate, reliable and proven
- ◆ Storage of 160,000 data sets
- ◆ Data averaging
- ◆ Graphic display
- ◆ Lightweight battery portable
- ◆ Designed for rapid screening



Reliable chlorophyll content determinations

The CCM-200 *plus* is the world's most advanced chlorophyll content meter providing fast, accurate and reliable determinations on intact plant leaves and crops.

The CCM-200 *plus* is a second generation chlorophyll content meter offering many advantages in performance, data storage and data handling compared with earlier devices.

Non-destructive and battery portable

The battery portable CCM-200 *plus* provides chlorophyll content determinations in the field without the need for destructive laboratory sampling. Specifically designed for fast field screening, each measurement takes only 2-3 seconds to perform.

Chlorophyll content is expressed in CCI (Chlorophyll Content Index) units. Published documentation is available advising how CCI units can be converted into actual chlorophyll concentrations within the leaf.

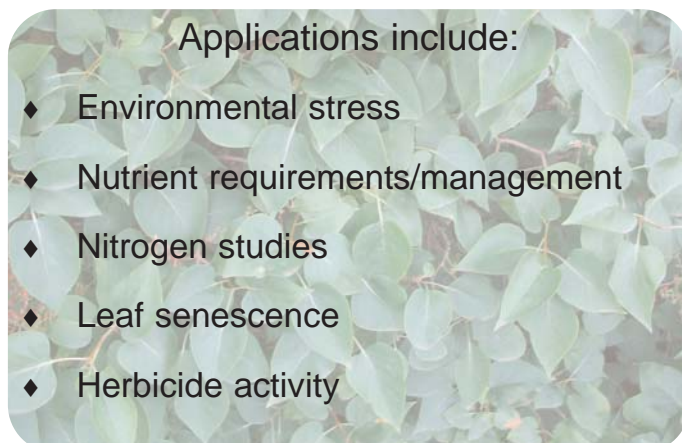
Data averaging

Data may be made as:

- Single measurements
- 2-30 measurements averaged (with graphing)
- 10-30 measurements averaged with applied sigma 2 standard deviation to exclude rogue data points (with graphing).

Applications include:

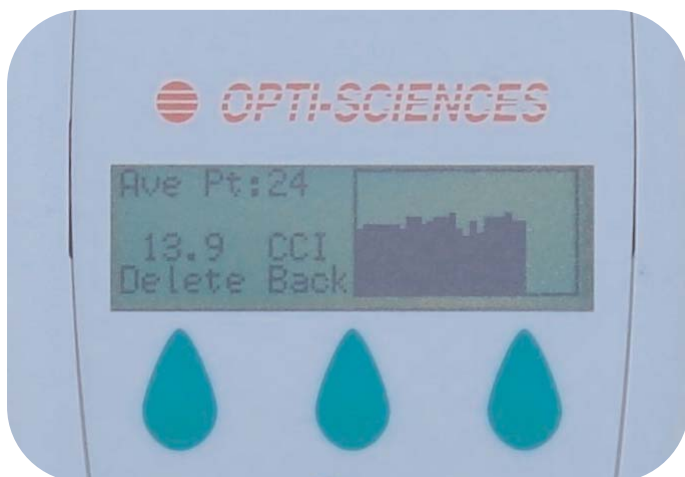
- ◆ Environmental stress
- ◆ Nutrient requirements/management
- ◆ Nitrogen studies
- ◆ Leaf senescence
- ◆ Herbicide activity



Large integral data storage

Up to 160,000 chlorophyll content measurements can be stored in the internal memory. There is no requirement for an external data logger, computer or frequent returns to the laboratory to download data. Stored data can be reviewed in the field, on the display.

Once back in the laboratory data is quickly and easily transferred to a PC via USB or RS232. Measurements may be output individually by USB or as the complete storage file.



Proven scientific principles

Chlorophyll has distinct optical absorbance characteristics that the CCM-200 *plus* exploits to non-destructively measure relative chlorophyll concentrations. Strong absorbance bands are present in the blue and red regions but not the green or infrared bands, hence the green appearance of a leaf.

By measuring the amount of energy absorbed in the red band an estimate of the amount of chlorophyll present in the tissue is possible. Absorbance in the infrared band can be used to quantify and account for leaf thickness, so providing a more accurate CCI value.

The CCM-200 *plus* employs new precision LED technology to further enhance measurement accuracy and repeatability.



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Technical Specifications

Measured parameters: Optical absorbance in two different wavebands: 653nm (Chlorophyll) and 931nm (Near Infra-Red) providing CCI value

Measured area: 1cm diameter circle

Resolution: 0.1 CCI unit

Repeatability: +/- 1 %

Sampling acquisition time: 2-3 seconds

Source: Custom 2 wavelength LED module

Detectors: Two silicon photodiodes with integral amplifiers for absorbency measurements, power monitoring and temperature compensation

Data modes: Single point, selectable 2-30 point average and a statistical 10-30 point protocol that disregards data beyond a 2 sigma standard deviation

Storage capacity: Up to 160,000 measurements

User Interface: 128 x 32 pixel graphic display, 8 keys for measurements, data manipulation, beep signal status and warnings

Output: USB 1.1 and RS232. By single measurement or complete storage file

Operating temperature range: 0-50°C

Temperature compensation: Temperature compensated source and detector circuitry for minimal drift over full range

Battery: 9V alkaline battery

Auto off interval: 4 minutes (with no key press or download)

Dimensions: 152 x 82 x 25 mm

Weight: 162g

