

# CI-203 Handheld Laser Leaf Area Meter



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The CI-203 Handheld Laser Area Meter uses advanced laser technology to give researchers a precise and convenient way to measure leaf area (or the areas of leaf-like objects). The high-resolution laser scanner, data logger, and transfective daylight visible display are all enclosed in a handheld unit weighing 750g. Researchers can perform non-destructive measurements on leaves of living plants by simply moving the leaf through the instrument; the graphic LCD displays the leaf image for confirmation and stores image for data audit purposes. Data sets are then tagged with date, time, and GPS location. Additionally, data sets can be retrieved through an onboard barcode generator. The CI-203 uses standard symbology to create barcodes containing alphanumeric data. For high-throughput measurements, the CI-203CA, conveyor attachment makes a perfect complement to the CI-203. For example, the CI-203 with conveyor provides a perfect solution for the quick measurement of whole-plant leaf area in a phenotyping study.

## Features

- ✓ Lightweight and easy to use
- ✓ Ideal for field studies
- ✓ Built-in barcode generator
- ✓ Virtually unlimited data storage
- ✓ High-resolution - 0.1cm<sup>2</sup>
- ✓ Optional conveyor attachment available for high-throughput measurements
- ✓ 7.2v rechargeable NiMH battery
- ✓ USB 2.0
- ✓ Performs non-destructive measurements
- ✓ Data set includes: area, length, width, perimeter, shape factor and aspect ratio

### ✓ Fast

Conveyor Attachment (CI-203CA) is perfect for high-throughput whole-plant leaf area studies

### ✓ Efficient

Built in encoder creates 1D and 2D barcodes for easy data retrieval

### ✓ Portable

Weighing only 750g., the CI-203 is ready for long hours in the field



## What's in the Box

- ✓ Laser leaf area meter main unit
- ✓ Internal battery
- ✓ Battery charger
- ✓ USB cable
- ✓ Communication software
- ✓ Operating manual
- ✓ Hard shell instrument carrying case



## Theory of Operation

The CI-203 collects length, width, perimeter, and area measurements directly using a combination of a sweeping laser beam and a roller position encoder. After activating the device by opening the wand JAW, a low energy laser beam sweeps across the laser window 500 times per second at a rate of 150 m/s. As the user moves the CI-203 wand down the leaf, the roller encoder records the motion, and the onboard processing unit collects the data. Each laser sweep provides data that accurately accumulates the area and perimeter measurements. When the roller detects that motion has stopped, the laser subsystem stops taking measurements and the processing unit computes and posts the final results.

The perimeter increment is calculated and added to the perimeter

$$\Delta p = 4\Delta l + (W_0 - W_1)^2$$

Where  $\Delta p$  is the perimeter increment  
 $\Delta l$  is the length increment (always 1mm)  
 $W_0$  is the current width measurement  
 $W_1$  is the previous width measurement

## Conveyor Attachment (CI-203CA)

Measure large numbers of detached leaves rapidly by inserting the CI-203 Handheld Laser Leaf Area Meter into the CI-203CA Conveyor Attachment, the combined unit will execute the leaf measurements and the data will be displayed and stored on the CI-203. Samples are fed between rubberized steel and glass rollers for scanning, eliminating the need for high-maintenance plastic belts.



### CI-203CA Specifications

Max. Sample Thickness	15mm
Max. Sample Width	150mm
Max. Sample Length	3m
Resolution	0.01mm <sup>2</sup>
Accuracy	± 0.5% for samples >10cm <sup>2</sup>
Interface	RS232C serial interface
Scan Speed	10cm/second
Operating Temperature	0 - 50°C
Power Requirements	6 to 10 VDC at 100mA. We will provide an external AC adapter (110 VAC, 60 Hz or 220 VAC, 50 Hz)
Dimensions	32L × 18W × 13Hcm
Weight	2.95kg

# Specifications



CI-202 Specifications



CI-203 Specifications

Format	Palette	Wand
Scanning Technology	Laser	Laser
Measuring Thickness	15mm	15mm
Measuring Width	150mm	150mm
Measuring Length	1m	3m
Scanner	675nm Laser Diode	675nm Laser Diode
Resolution	0.01cm <sup>2</sup>	0.01cm <sup>2</sup>
Accuracy	± 1% for samples > 10cm <sup>2</sup>	± 1% for samples >10cm <sup>2</sup>
Interface	USB 2.0	USB 2.0
Memory Size	8,000 measurements	4GB SD card, virtually unlimited measurements
Display	LCD - 16 characters x 2 lines	Transflective LCD Graphic display
Scanning Speed	200mm/sec	200mm/sec
Battery	7.2v rechargeable NiMH	7.2v rechargeable NiMH
Battery Capacity	250 scans	250 scans
Operating Temperature	0 - 50° C	0 - 50° C
Dimensions	Board - 38.5cm x 21.5cm x 3cm Scanner - 11.5cm x 20cm x 8cm	35.5cm x 4.5cm x 5cm
Weight	1.5 Kg	750g
Accessories	None	CI-203CA Leaf Conveyor

## Publications & Applications

For more information about applications and a full list of publications, please visit [www.cid-inc.com/publications](http://www.cid-inc.com/publications)

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