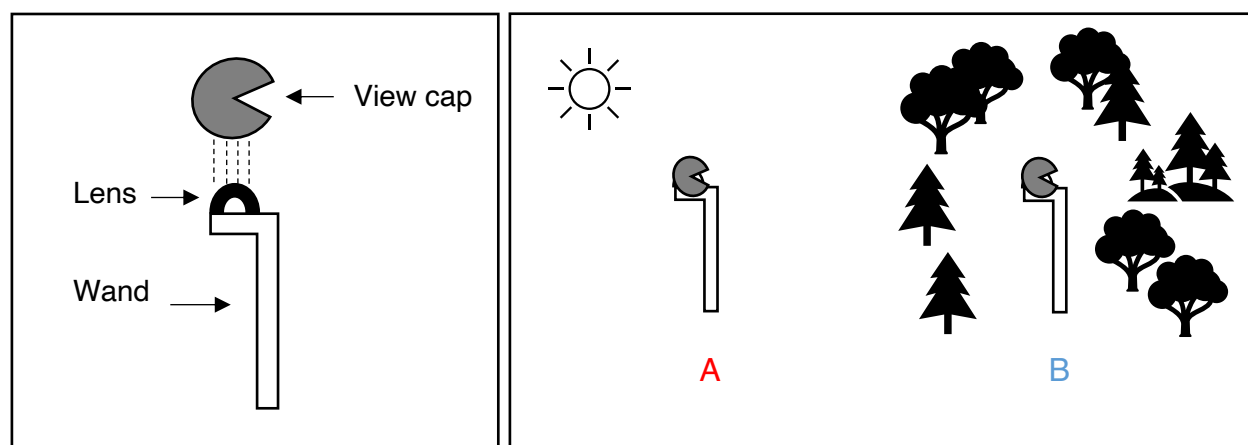


LAI 2200C Simplified Protocol

General principle

The **leaf area per unit ground area** (leaf area index, LAI) is calculated by measuring the difference in light intensity between two sensors positioned on their respective sticks (called *wands*). The first sensor is installed above the canopy or outside of the forest (**A sensor**), and the second sensor is installed inside the forest (**B sensor**). The difference between both gives the LAI. As measurements are altered by the direct sunlight and the shade from the person taking the measurements, a view cap will be put on the sensor's lens, hiding it partially from the sun and the person. Different types of view caps can be used, depending on the site/weather conditions. One must put the same view cap, identically oriented to the sun on the two wands during the entire measurement. The LAI is underestimated by light scattering, and corrections can be achieved by calibrating the **A sensor**.



Taking measurements

1. Be sure that one of the wands is set to "Above" (blue light, **A sensor**), and the other to "Below" (no light, **B sensor**). Press "A" on the wand to change from A-mode <=> B-mode.
2. Put the same view cap on both sensors, depending on the weather and the site. The choice of the view cap depends on sky conditions and light constancy. If conditions are stable and light is uniformly distributed in the research area, use a wide-opened view cap (usually a 180° view cap). If the sun is shining or if the sky is obstructed by trees/buildings, use a smaller view cap (>270° view cap).

3. A. Above wand

The **A sensor** will be installed in an open area or above the canopy, to receive the maximum direct radiation from the sky. The **A sensor** will be programmed to take measurements automatically at a fixed time interval.

- Connect the wand to the control unit. Go to *Menu -> Wand Setup* and select the wand.
- Synchronize the clock in *Clock -> Sync time*.
- Go to *Auto Log*. Activate the auto log (put ON), give a *start* and *end* time of the measurements and specify the frequency of measurements.
- Attach the wand on a stick or to a surface and disconnect it from the control unit. **Make sure that the lens is levelled** (check the bubble!). Orient the wand so that the sun is blocked by the view cap and measure the view cap opening orientation with a compass. You will have to reproduce the same orientation for all measurements on the **B sensor**.

3. B. Below wand

- Connect the wand to the control unit and press the *START STOP* button.
- Create a new file and give it an appropriate name. Note that the number of characters is limited to 6.
- Make sure that the lens is levelled. Orient sensor B as sensor A with the compass and press LOG. Take five measurements for each position you want to measure.
- Once you measured five times, press START STOP again. You can now go to the next position you want to measure and start again. Create a new file!

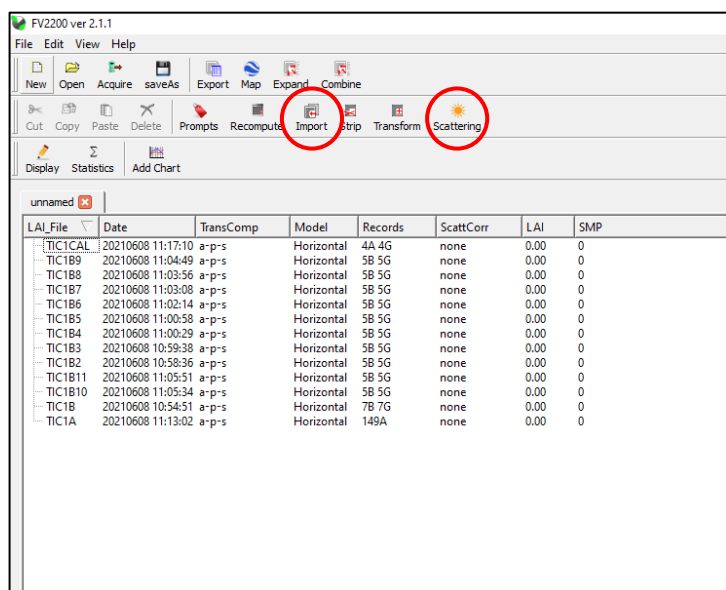
Scattering corrections

To correct scattering effects, you will do 4 additional measurements with the **A sensor**, at the same position where you installed it for the auto logging.

1. Take the A wand and create a new file with an appropriate name. You want to separate these calibration data from the ones you auto-logged previously. To do so, an easy way is to switch from A-mode to B-mode by pressing A on the wand
2. Put the diffuser cap (complete, white view cap), expose it completely to the sun/sky, and log once. With that same view cap, log once in the shade of the person taking the measurements.
3. Remove the cap and take a second measure within the person's own shadow (without any view cap).
4. Finally, put the view cap that you use for the measurements, orient the wand as for the other measurements, and log once.

Reading values on FV2200 software

1. Connect the LAI to the computer and open or drag & drop the files in the software interface.
2. Press on *Import*. Toggle the B files in the *Dest* column and the A file in the *Source* column. Once *OK* is pressed, LAI values appear for B rows in the main interface.



3. Press on *Scattering*. On the *K records* tab, select the calibration file (basically AAAA) and specify the view cap/orientation of the sensor. Save the correction by pressing *Make K records in Checked Files*.

4. Back to the main interface, **select the B files**, and press again on *Scattering*. Go this time to the second tab called *Clipboard*. Be sure that *Scatter correction* is ON and fill View cap and View orientation as previously. Press on *Update Selected Scatter-Corrected Files*: the correction has occurred, and LAI values are changed in the main interface.

Import Records

Dest files: For each an imported A record.

Source files: Choose A records to import using

☐ Adjust imported A values by

Method 1:

☐ Compute adjustment for each Dest file independently

☐ Interpolate match records (only for special circumstances)

View	Source	Dest	File	Date	From	To	#A	#B	#L	#?	#1	#2
☒			TIC1CAL	20210608	11:17:20	11:20:31	4	0	0			
		☒	TIC1B9	20210608	11:05:05	11:05:16	0	5	0			
		☒	TIC1B8	20210608	11:04:30	11:04:36	0	5	0			
		☒	TIC1B7	20210608	11:03:27	11:03:46	0	5	0			
		☒	TIC1B6	20210608	11:02:41	11:02:52	0	5	0			
		☒	TIC1B5	20210608	11:01:51	11:01:58	0	5	0			
		☒	TIC1B4	20210608	11:00:44	11:00:52	0	5	0			
		☒	TIC1B3	20210608	11:00:09	11:00:21	0	5	0			
		☒	TIC1B2	20210608	10:58:58	10:59:07	0	5	0			
		☒	TIC1B11	20210608	11:06:33	11:06:39	0	5	0			
		☒	TIC1B10	20210608	11:05:37	11:05:47	0	5	0			
		☒	TIC1B	20210608	10:57:01	10:57:58	0	7	0			
	☒		TIC1A	20210608	10:48:10	11:12:50	149	0	0			

OK Cancel

Scattering Correction Input Tool

K Records Clipboard Selected File

☒ Scatter Correction is ☒ ON ☐ Off

(1/3) Scattering Properties

☒ Leaf Reflectance

☒ Leaf Transmittance

☒ Ground Reflectance

(2/3) View Cap Info (ignored if K records present)

☒ Wide Sky View Cap

☒ 'A' View Cap

☒ 'A' View Direction 0=N, 90=E, etc.

(3/3) GPS (ignored if G records present)

☐ Latitude

☐ Longitude

☐ UTC + (hrs) = Local Time