

Environmental Measurement Japan

Leaf Area Index Sensor Catalog



MIJ-15 LAI/K2

Environmental Measurement Japan, CO., LTD.



2-52-42 Takamidai, Fukuoka-city Higashiku, Fukuoka 811-0215, Japan
TEL 092-608-6412
FAX 092-985-7844

Environmental Measurement Japan

Overview

Conventional measuring instruments of Leaf Area Index (here in after referred to as LAI) used comparison of light intensity between outside and inside of plant canopy. MIJ-15LAI Type2/K2 quantify LAI by measuring the spectral ratio of sunlight transmitted through plant canopy.

Features

- The world's only sensor that adopted the relationship that the spectral ratio of PAR and IR correlates with LAI.
- True LAI measurement capable of counting only live leaves is possible, not PAI (Plant Area Index) where influences such as dead leaves, branches, trunks remain.
- /K2 for fixed - point observation so you can get seasonal changes of LAI just by connect to data logger.

True LAI value

The measurement principle with the conventional plant canopy analyzer was the same principle as the area ratio of so-called monochrome photographs, which detects the light intensity ratio inside and outside the plant canopy and replaces the bright / dark ratio with LAI. Generally in sunny weather, the intensity of sunlight on the ground is temporally unstable due to the influence of clouds. For this reason the principle does not hold unless we measure both the light intensity of outside and inside of the canopy at the same time. In order to measure LAI only by measurement inside the canopy, there was the inconvenience that it was only in the cloudy weather where the solar radiation intensity was relatively stable. Even if such a troublesome work was carried out, the light shielding structure, the trunk, branches, and dead leaves other than the leaves also greatly affected the light intensity, so it was practically not the LAI but only the PAI was measured. If you want to measure LAI instead of PAI, you need to correct the value of PAI and convert it to LAI using measurement data of canopy which became only branch and trunk after complete fallen leaves in winter every year is. In the case of plants that do not deciduous, this kind of correction is also impossible.

MIJ-15s use patented measurement method JP 5410323 B2 2014.2.5 discloses two kinds of lights, PAR (400-700 nm) and NIR (700-1000 nm) are reflected and absorbed by chlorophyll in leaves and the ratio of transmitted light correlates with LAI. With this method, it is possible to measure true LAI stably regardless of the weather. The light environment outside the canopy is irrelevant. Overall, LAI measurement with less disturbance factors and high repeatability has been realized.

Specifications

Measurement Range	0~5,000 μ E
Output	Voltage (Calibration Coefficient labeled as ###.## μ E/mV) System Sensitivity: PAR/10mV at 2300uE, NIR/5mV at 1300uE
LAI arithmetic expression	$LAI=2.80\ln(NIR/PAR)+0.69^*$ (*Kume et al.(2011) J Plant Res124:99_106.)
Temperature effect	< \pm 0.1%/DEG
Unit	PAR & NIR: μ E(μ mol \cdot S ⁻¹ \cdot m ⁻²), LAI: dimensionless
Response	0.2u/Sec
Incidence angle characteristics	< \pm 1.5% at 0~79°(< -50%Peak at 80~89°)
Angle of rotation characteristics	< \pm 0.5% over 360° at 60°elevation
Temperature Range	-40~80°C
Size	126mm(W), 60mm(D) \times 49mm(H)
Weight	500g
Standard Pack	MIJ-15LAI TypeII/K2 (With 5m cable)

Environmental Measurement Japan, CO., LTD.



2-52-42 Takamidai, Fukuoka-city Higashiku, Fukuoka 811-0215, Japan
TEL 092-608-6412
FAX 092-985-7844