Chlorophyll Fluorescence Imaging System
HEXAGON-IMAGING-PAM

Technical specifications

The HEXAGON-IMAGING-PAM employs a very compact and powerful 600 W LED array for homogeneous illumination of up to 20 x 24 cm areas with pulse-modulated excitation, actinic light, and saturation pulses.

An aluminum bottom plate is used on the one hand to position a series of individual leaves in the focal plane or can also be used as a support for plant trays in a lower position. The focus of the 8 mm objective can thus remain at the same setting.

To position individual specimens conveniently, the higher position of the base plate is used (Figure 1). The samples can be inserted through the sliding doors at the front. Seedlings in plant trays can be inserted and measured from the side in a lower position.

Provided that safety with regard to artificial optical radiation remains guaranteed, the LED array could also be used alone without the base (the door sensor then would have to be connected to the alternative safety system).

It is recommended to run the system via a desktop computer directly connected to its Ethernet interface card (no hubs in between) and a separate monitor with the resolution that is recommended below for best image quality.

Design:

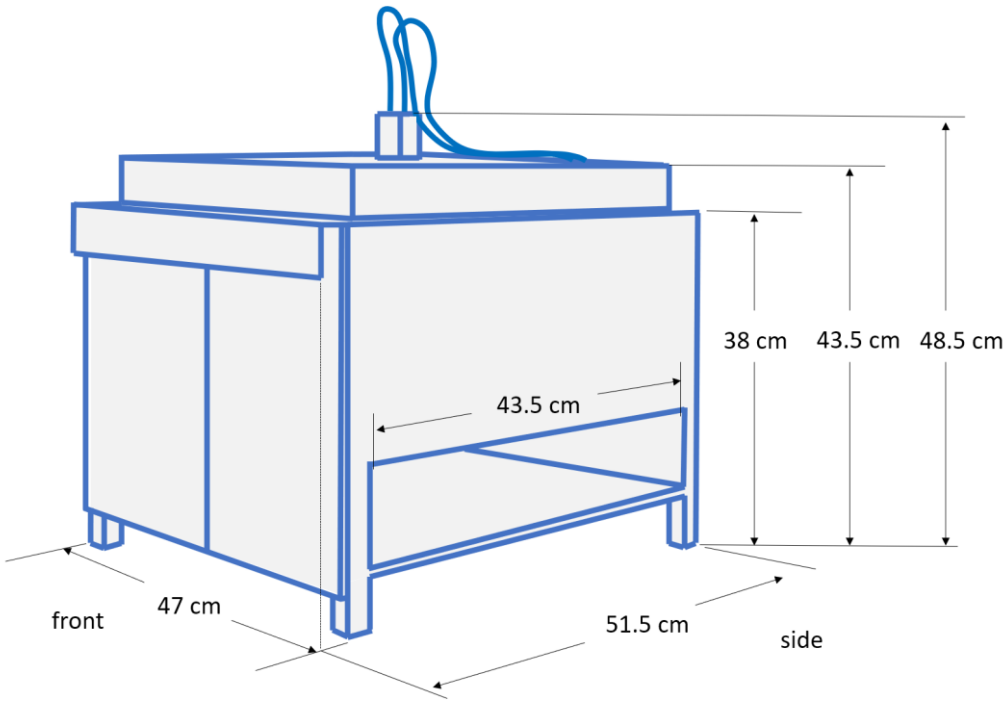
the aluminum housing is closed in the front area by a split sliding door. A safety mechanism prevents the saturation pulse when this is open. Samples on trays can be inserted from the side.

The sample chamber is light-tight ventilated to prevent excessive heating of the samples during the measurement.

Measured area:

The area of the highest illumination homogeneity, together with the lens used and a working distance of about 20 cm allows the imaging of 20 x 24 cm.

Dimensions:



HEXAGON-PAM alone without power supply and control computer

Light source for fluorescence excitation and actinic illumination:
Selected high power Cree LEDs with 451 nm dominant wavelength, modulation frequency 1-8 Hz; max actinic intensity 2000 µmol quanta m^{-2} s^{-1} PAR; maximum saturation pulse intensity 4100 µmol quanta m^{-2} s^{-1} PAR

Far red light: Peak emission at 730 nm.

Signal detection: Sony IMX264 CMOS 2/3" Sensor with 3.45 x 3.45 Pixel size

User interface: Windows 10 desktop PC with ImagingWinGigE Software (included). The device is connected via GigE, keyboard operation.

Light field properties: Vertical incidence on sample; LED distribution optimized for uniformity; at standard working distance maximal deviation from mean intensity +/- 7 %

Data output Format: xpim, csv, jpg, gif (raw image format 10 bit color depth, 1200 x 1000)

Power supply: external DC laboratory power supply (48 V, included)

External Control: Intel NUC Mini-PC with Win 10 OS (Intel Core i5-1135G7, cores 4, threads 8, Intel Iris Xe graphics, i5 vPRO (TPM 2.0), 8 GB RAM, minimum 512 GB SSD, internal Thunderbolt 4 card). Dimensions: 117 x 112 x 54 mm.

For the monitor, a native resolution of 2560 x 1440 pixels (WQHD) is recommended.

Software: Win-PC software ImagingWinGigE (and updates) included

Operating temperature: 5 to +45 °C (non-condensing)

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