

# FluorCam 1300



**FluorCam 1300** is a highly innovative, compact system for imaging of chlorophyll fluorescence kinetics. The system provides a wealth of information about plant's photosynthetic capacity, physiological and metabolic condition, as well as its susceptibility to various stress conditions.

**FluorCam 1300** features the unique flat LED panel design which results in a highly uniform illumination across the whole imaging area (**200 x 200 mm**) with minimum shading effects.

The **standard version** of FC1300 contains multiple LED sources for use in excitation of chlorophyll in various ChlF protocols. The red-orange LEDs are used for measuring flashes and actinic light. The cool white LEDs are used for saturating pulse and as additional actinic light. The Far-Red LEDs are employed in estimation of  $F_o'$ .

**High-resolution CCD camera** allows both measurement of ChlF and detection of weak steady-state fluorescence signals, where long integration times are needed. Applications where high spatial resolution of the fluorescence signal is of importance will also benefit from the High-resolution CCD camera.

The **enhanced version** of FC1300 is supplemented by a state of the art Multi-Excitation Module combining conventional chlorophyll fluorescence measurements with the various fluorescence or reflectance signals. The light source for multispectral fluorescence

includes, additional to the standard Cool White, Red-Orange and Far Red, 6 LED colors. These are: UV, Royal Blue, Blue, Cyan, Green and Amber.

FC1300 also includes a motorized, software-controlled filter wheel equipped with **up to 7 different emission filters**, allowing for a number of experimental protocols as required by the user:

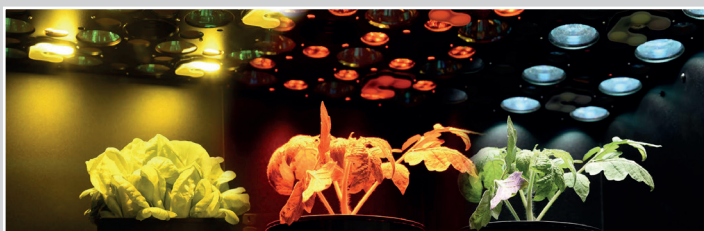
- detection of fluorescent proteins and dyes (CFP, GFP, YFP, RFP, mCherry, SYBR Green...)
- multi-color fluorescence and auto-fluorescence analysis
- measurements of chlorophyll fluorescence excitation spectra
- quantification of pigments (flavonols, anthocyanins, chlorophylls)

The **FluorCam 1300** system is compact and allows easy dark adaptation of the sample.

The system includes a high-performance PC and comprehensive software package which provides full device control, data acquisition and image processing.

Experienced users may design new protocols with sophisticated programming language and vary the timing and measuring sequences.

# Specifications



## CCD DETECTOR

Camera	High-resolution CCD camera TOMI-2
Resolution	1360 x 1024 pixels
A/D Converter Resolution	16 bit (65536 grey levels)
Pixel Size	6.45 $\mu\text{m}$ x 6.45 $\mu\text{m}$
Frame Rate	20 frames per second for full resolution
CCD Detector Wavelength Range	400-1000 nm
Spectral Response	QE max at 540 nm (~72 %), 50 % roll-off at 350 nm and 800 nm
Read-Out Noise	< 8 electrons RMS
Full-Well Capacity	> 22000 electrons
Dynamic Range	65 dB
Connectivity	Control and data: Gigabit Ethernet
Operating Modes	Video (ChIF), Snapshot (long integration times for FPs detection)

## LIGHTS

Light Sources	Red-Orange 618 $\pm$ 10 nm Far Red 735 $\pm$ 10 nm Cool White 5700 K
Super Pulse Intensity	> 5,000 $\mu\text{mol. m}^{-2.} \text{s}^{-1}$
Actinic Light Intensity	Up to 2,000 $\mu\text{mol. m}^{-2.} \text{s}^{-1}$
Additional Lights	UV 365 $\pm$ 9 nm
	Royal Blue 450 $\pm$ 10 nm
	Blue 475 $\pm$ 10 nm
	Cyan 505 $\pm$ 15 nm
	Green 530 $\pm$ 15 nm Amber 590 $\pm$ 40 nm

## DETECTION CHANNELS

Filter Wheel	up to 7 emission filters
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## TECHNICAL DATA

Dimensions (W x D x H)	562 x 560 x 752 mm
Weight	63 kg
Electrical	90-264 VAC
Power Consumption	1500 W
Operating Temperature	5-40 $^{\circ}\text{C}$
Operating Humidity	0-90 %

## SOFTWARE

- fully automated control of FC1300 device
- image acquisition via automated experimental protocols
- numerous image manipulation tools
- automatic data analysis and parameters computation

Fluorescence Parameters	Measured: $F_{O'}$ , $F_{M'}$ , $F_{V'}$ , $F_{O''}$ , $F_{M''}$ , $F_{V''}$ , $F_T$ Calculated: $F_{V'}/F_{M'}$ , $F_{V''}/F_{M''}$ , $\text{Ph}\Phi_{\text{PSII}}$ , NPQ, qN, qP, Rfd, and many others
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