



## Customized FluorCams

**Customized FluorCams** are complex multispectral imaging systems that are manufactured according to customers very specific needs. They attain all capabilities and features of the standard FluorCams. In addition other imaging and scoring units such as RGB camera for true color analysis or thermal imaging for leaf surface temperature monitoring can be incorporated into the system. The specific construction of the systems makes them modular to fit the customer needs. The systems are designed to enable using them over large areas of the sample interest from single plant level up to field application and imaging of plant populations. Robust and stable construction of the Large Customized Imaging Systems is designed to suite all types of conditions from field environment, to greenhouse or lab application.

Measured objects can be as small as freshly germinated Arabidopsis plants or as large as small canopies in the customized large FluorCams. Large customized FluorCam Systems can be incorporated into cultivation chamber and serve both as cultivation light source and as monitoring unit in FS-SI-FL FytoScope with fluorescence imaging.

### ▼ APPLICATIONS

- Photosynthetic performance
- Abiotic and biotic stress responses
- Plant growth performance and plant development
- Pathogen interactions
- Trait assessment
- Genetic variation
- Agriculture and horticulture

### ▼ CUSTOMIZED FLUORCAM MEASURE

- $F_v/F_m$
- Kautsky induction
- Quenching analysis
- Light Curve
- Fluorescent proteins: GFP, YFP, redFP (filter wheel required)
- PAR module optionally in some of the versions (FC 800D/3535)

### ▼ KEY FEATURES

- Both lab and field applications
- Flexibility in measurement setups
- Custom-made solutions
- High-sensitivity camera TOMI-1
- High-resolution camera TOMI-2
- Super Pulse illumination:
  - White: up to  $6,000 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- Actinic illumination:
  - Red-orange (620 nm): up to  $500 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
  - White (6,500 K): up to  $1,500 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- Additional illumination:
  - UV (400 nm) for GFP detection (optional).
  - Deep-red (660 nm) and FAR (740 nm) for PAR Absorptivity and NDVI measurement (optional)
  - Variable imaged area
- Supplied with full system control software
- Supplied with full image processing tools

## EXAMPLES OF CUSTOMIZED FLUORCAMS

- FS-SI-FL FytoScope with fluorescence imaging unit
- Rover FC 900-R
- Arch FC 900-A
- FluorCam FC 800D/3535-15, FluorCam FC 800D/3535-15-GFP
- FluorCam FC 800D/3535 in light-isolated gas proof chamber

## DEVICE SPECIFICATION

### FS-SI-FL FytoScope with fluorescence imaging unit

is a customized fluorescence imaging system that has been implemented into the step-in FytoScope type of plant growth chamber. Step-in FytoScope enables the researcher to maintain controlled growth conditions for temperature and humidity according to the pre-defined protocol. Inside the FytoScope chamber is a frame with large custom FluorCam unit installed which is used as light source providing excellent spectral quality with high irradiance for plant growth. In parallel the light panel is used as modulated, actinic and saturating light source for kinetic fluorescence imaging. For user convenience both actual inside conditions and target values for temperature and relative humidity are permanently displayed on the touch screen controller situated on the front side of the FytoScope.

### Arch FC 900-A

is a customized fluorescence imaging system for three dimensional studies. The stand and the frame are exceedingly steady, yet the whole structure provides very flexible viewing angles. Large plants can be analyzed from various positions without the need to move them. Three dimensional image data are collected and the software can generate 3D images of Chl-fluorescence emission.



### Rover FC 900-R

is a customized fluorescence imaging system for large-scale scanning in the field. It has a remarkably stable structure, yet its large and solid wheels allow easy movement in the field. Large plants (e.g., corn, soy plant) can be studied *in-situ* without detaching or destroying them. The camera and light panels can be enclosed in a cabinet for more convenient control of dark adaptation and actinic light. The system scans area of 200 x 200 mm and its height can be adjusted from 200 to 1,500 mm. If required, an additional camera can be used for true-color analysis.



### FluorCam FC800D/3535-15 and FC 800-D/3535-15-GFP

is standalone customized fluorescence imaging system for quick indoor screening of plant up to 1 m of height. The light panel with CCD camera is mounted in the supporting construction, where the height of the light panel can be easily changed according to the plant height. The area of 350 x 350 mm is imaged and the height can be adjusted from 350 to 1,350 mm. Version FC 800-D/3535-15-GFP is intended for imaging of both chlorophyll fluorescence and green fluorescence protein (GFP). Optionally the PAR absorptivity module for NDVI measurement can be added to both version of the system.



### FluorCam FC 800D/3535-15 in light-isolated gas proof chamber

is a customized chlorophyll fluorescence imaging system, where the light panel with CCD camera is mounted in the light-isolated gas proof chamber. The chamber allows to provide dark adaptation prior the chlorophyll fluorescence measurement with scanning area of 350 x 350 mm.

