



## LED Fyto-Panels

LED Fyto-Panels are primarily intended for installation in growth chambers, or for other similar applications where controlled, large-area illumination is of high importance. The Fyto-Panels provide high-intensity light with uniform light distribution. They are manufactured as single color and optionally also multi-color series with each color being separately controllable in intensity by the power supply. Far-red LEDs (735 nm) and deep red (660 nm) can be optionally added to ensure optimal conditions for plant growth. Infrared LEDs can also be controlled separately.

Single LED Fyto-Panel dimension is 270 × 810 mm. Multiple panels can be interconnected if larger area needs to be illuminated. LED Fyto-Panel as a single or multiple unit can be operated through a PC program which is provided together with the Fyto-Panel. Optionally, Fyto-Panels can be supplied with the Light Controller or Light Studio Software; they both enable precise control of the light mode, timing and intensity via user-defined protocols. In addition, special protocols for daylight mimicking or cloudy sky simulation may be provided.

### ▼ APPLICATIONS

- Plant science
- Agricultural and biotechnology research
- Plant growth and development
- Plant biomedicine

### LED FYTO-PANEL VERSIONS

The panels are manufactured in three basic versions (A, B, C) and three “half” versions (A-1/2, B-1/2, C-1/2) that differ in power input and maximum reachable irradiance (measured in 1 meter distance from the light source):

**Version A:** maximum reachable irradiance 500  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Version A-1/2:** maximum reachable irradiance 350  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Version B:** maximum reachable irradiance 1,000  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Version B-1/2:** maximum reachable irradiance 1,000  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Version C:** maximum reachable irradiance 1,500  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Version C-1/2:** maximum reachable irradiance 1,500  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (cool white)

**Multi-Color:** maximum reachable irradiance 1,400  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (up to 7 channels)

### ▼ KEY FEATURES

- Uniform light distribution over the desired area
- Light irradiance in the range from 430 to 1,600  $\mu\text{mol.m}^{-2}.\text{s}^{-1}$  (at the distance of 100 cm)
- Precise intensity control in the range of 1 to 100 %
- Standard panel setup: cool white LEDs with added far-red LEDs (735 nm) and deep-red LEDs (660 nm)
- Optionally, bi-color and multi-color versions available with each color being separately controllable in intensity, timing and modulation
- Minimum undesirable heating effects to experimental material
- Independently programmable LED-based illumination controllable in its power, spectral composition and temporal modulation
- Timing steps from seconds to hours and days
- User defined protocol control – via the Light Controller LC100 or Light Studio software (optional)
- Lifespan of up to 70,000 hours of continuous lighting

## MULTI-COLOR LED FYTO-PANEL

This Fyto-Panel can be equipped with up to 7 different channels /colors - each color being separately controllable in intensity. Standard color setup covers full spectrum for plant growing: blue, green, red, deep-red, white, far-red, infra-red (other colors as an option).

- Sun light simulation
- Cloudy sky imitation
- Dawn and Dusk imitation
- Specific pigment excitation
- Drive of individual phytochromes
- Simulation of Red and far-red ratio

### LIGHT CONTROL

#### Basic control software

- ON/OFF control and intensity settings
- Basic control settings through a PC program provided

#### Light Controller LC 200 (optional)

- User-friendly operation
- Precise control over the light mode, intensity and timing (seconds to hours)
- Supports up to 8 lights/colors
- Each light /color can be configured and controlled independently
- Light modulation according to a predefined function (continuous, pulse, sine, triangle)
- Two light/dark phases
- User-Defined Custom Protocol with up to 224 intervals (optional)
- Daylight Protocol for cloudy sky simulation (optional)
- No PC needed

#### Light Studio Software (optional)

- User-friendly GUI for protocol writing
- Day/night simulation – dawn and dusk simulation
- Precise control over the light mode, intensity and timing – timing from seconds to hours
- Supports unlimited number of logical light channels formed from up to 254 physical light devices – Fyto-Panels
- Each logical channel can be configured and programmed independently
- Fully programmable light modulation – built from user-defined segments (continuous light and ramp)

### KEY FEATURES

- LEDs offers highly defined parameters of irradiance
- Light intensity changes in the range of 0–100 % of total output
- High homogeneity of irradiance
- Generation of short light pulses enabled
- High light intensities up to  $1,400 \mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- Minimum heat effect
- Durable, low cost and environment saving system

### TECHNICAL SPECIFICATION

- **Panel External Dimension:** 81 × 27 cm, 1/2 version 41 × 27 cm  
Version A, Version B, Version C, Multi-Color
- **Standard Light Color:**  
Cool white + far red (735 nm)+ deep red (660 nm) – version A, B, C  
• from blue to infra-red – Multi-Color
- **Multi-Color:** from blue to infra-red
- **LED Lifespan:** 60 000 to 70 000 hours of continuous lighting
- **Light Intensity Control:** 0–100 % of total output
- **Power Input:**
  - Version A: 280 W
  - Version B: 360 W
  - Version C: 550 W
  - Version A-1/2: 130 W
  - Version B-1/2: 220 W
  - Version C-1/2: 320 W

