

Smart Grow Lighting

Light management assisted by artificial intelligence



+33(0)4.86.65.83.38
contact@vgd-led.com
www.vgd-led.com



Smart Grow Lighting

Naturally optimize production yields from 1.2 to 5x* and consume 30 to 60%* less energy

Led plant lighting complements natural light. Assisted by Artificial Intelligence, it increases plant growth while improving the organoleptic properties of the crops (taste, texture, size,...)



VGD is a manufacturer of LEDs and software solutions dedicated to vegetal lighting. It deploys in a few days, whatever the existing infrastructure (greenhouses, indoor, HPS / Leds...), a turnkey lighting system (hardware + complete software or just software modules) to complement or replace natural light, which :

- improves plant growth by crop type and growth phase,
- reduces energy consumption thanks to LEDs and real-time control,
- minimizes the use of various inputs by maximizing illumination,
- drastically improves yield per m² and crop distribution.
- optimizes cycles: all year round, crop rotation, early germination...)

* figures after internal tests, at VGD customers' premises or in partnership with the technical teams of plant R&D centers

A "from seed to plate" approach

Seeds

Seedlings

Flowering, growth
and ripening

Storage



Seed companies & research

Growing rooms
R&D Laboratories
Samples and tests
Varietal research
Medical research
Plant diseases

Greenhouses, indoor market gardening

Greenhouses
Horticulture
Multipliers
Aquaculture
Algoculture
Vertical farming

Nursery growers
Flowers
Medicinal &
perfume plant
....

Storage & Distribution

Stalls and large market stocks
Garden centre buffer stock
Bio-waste recovery
Urban farms
Canteen supply, public landscape
architects,...

The solution allows producers
to respond to market trends:

- Consuming locally
- Reduce inputs / organic
- Reduce your carbon footprint

A standard or tailor-made solution for all actors in the chain that can be adapted to existing infrastructures such as greenhouses, lighting, software, etc.



Produce more, but better!



LOWER ENERGY CONSUMPTION

In addition to natural light
- 40%* traditional VS LED consumption
- 30 to 50%* thanks to artificial intelligence



kg/sqm

PLANT GROWTH

Plant growth + 30 to +300%*
Homogeneity and stability of production
Makes it possible to grow sensitive crops



IMPROVED TASTE

Improvement of taste values*
Conservation textures, smell,...*
Sugar level increase (+15%*)



FAST R.O.I.

Investment amortized in a few months
Energy bill -30% to -50%*
Eligible for energy financing and research tax credits



SIMPLE SETUP

Compatible with leds & imported lighting
Installation by recognized integrators
Remote monitoring by experts



ECO-FRIENDLY

Led life > 50 000 hours
Limitation of inputs and pesticides
Reducing the carbon footprint

* Internal data or partners/customers: 17 days of earliness observed for an accelerated seed-to-seed culture in peppers, 15% increase in Brix rate, 38% yield for the CLIMSTON Tomato variety (in 12 weeks of cultivation)...



When to use smart grow lighting ?

A bad light....



Dynamic spectrum modulation

Disturbed weather....



Re-calibration of the lighting profile

Piloting / Growth simulation



Spectrum for each crop

Secure germination....



Increased contributions in blue light

Retain at the end of the chain....



A fine control of the ripening process

More natural light....



Real-time light sensors

Produce all year round....



Management of growth phases

Growth retardation....



Variations on compound light

Boost flowering....



Increased red light inputs

Improve the taste....



Boost the red trend lights



But also alert growth delays, comparison of crop growth history, crop calibration for greater reproducibility, optimization of other inputs.....



Optimized lighting control

Solutions 100% adapted and optimized for each crop, deployable in a few days, for all your greenhouse or indoor projects: R&D laboratory, seed companies, cultivation chambers, multipliers, producers (fruit, vegetables, herbs, flowers, nursery), distributors...

Light Box

Control center and optimization box for lighting and plant growth.

Compatible with market LEDs, Sodium lamps and others

Smart Leds

Led top, rack or vertical

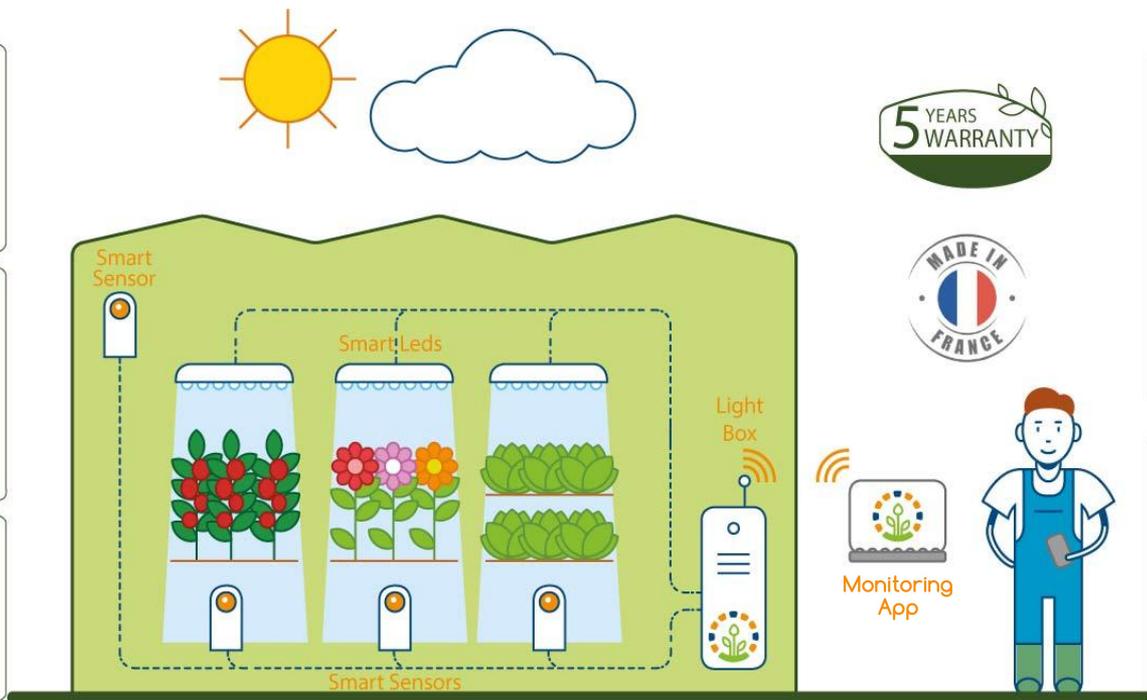
Lighting variation according to:

- real time light capture
- on/off, schedules & variations
- wavelength per plot
- crop type

Smart Sensors

Spectral sensor for lighting conditions

Other sensors :
temperature, growth



Piloting App

Piloting App

Real-time lighting control interface and plant growth by artificial intelligence:

- crop type
- plot / lighting group
- plant growth cycle

Data and logger learning

Real-time energy consumption analysis and by farming

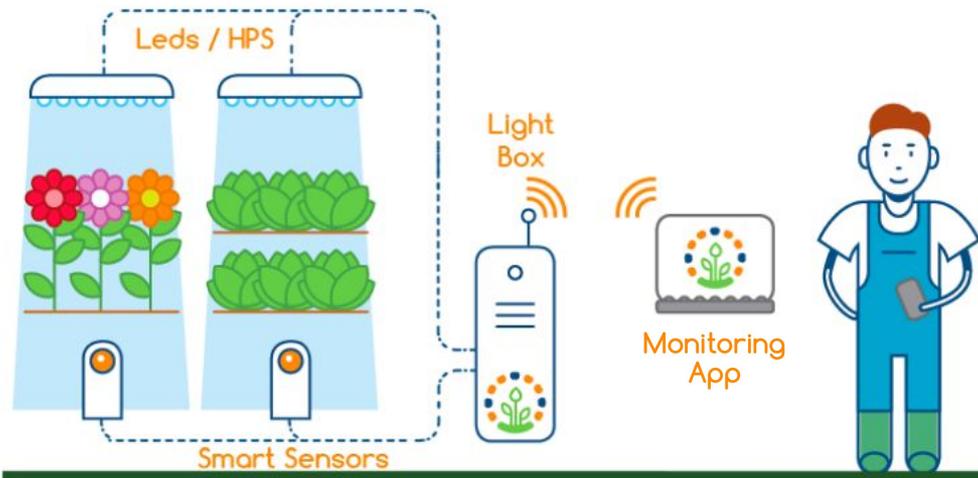
Customer service

Fast deployment with local authorized installer

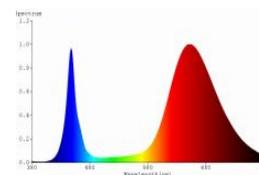
Global server management or local management with PC or via mobile application

Physiotherapy training and consulting / maintenance VGD

LIGHT BOX : Housing & lighting control unit



Wavelength / culture controllable



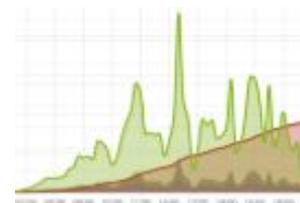
Real-time energy saving monitoring



Technical data

- integration in greenhouses or indoor or vertical farming
- compatible with VGD LEDs or other LED / HPS / Fluo lighting
- dimension: 400mmX600mmx600mmx200mm
- power: 100 Watts
- processor: i7 intel, NVIDIA graphics card (machine learning)
- Data logger: local (1000 GB) and/or unlimited in a secure cloud
- wifi connectivity, wired, remote (4G+)
- secure data backup
- Wired communication between lamps (eliminates radio frequency piracy)
- Modbus reliable field to control more than 3 ha

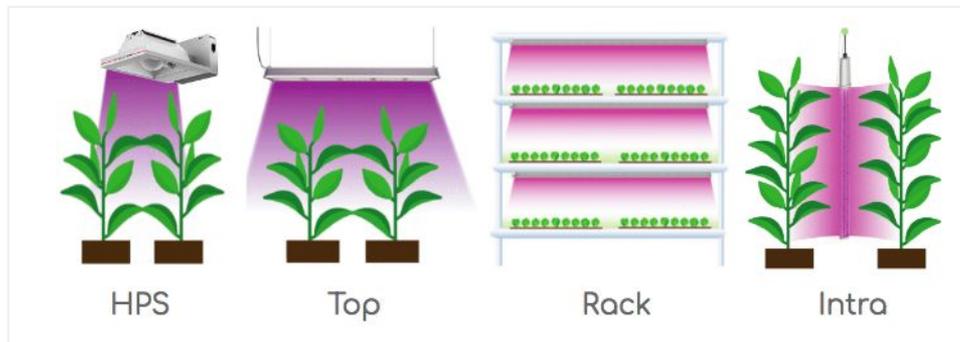
Statistics & Uses



Schedule programming

Nom	Début	Objectif	Etat de la module
PVET qualité et performance HAUT	08:00	25:00	500000 mod / 30000
Bandes	Objectifs	Etat des bandes	Consignes
Bleu	34 µmol/m ² /s	20 µmol/m ² /s (58.8%)	3.0 %
Vert	127 µmol/m ² /s	23 µmol/m ² /s (18.0%)	52.0 %
Rouge	287 µmol/m ² /s	51 µmol/m ² /s (17.8%)	20.0 %

SMART LEDS : Controllable LEDs



Lifetime
> 50000 hours (15 years)
34W/m²
344μmol/sqm/s to 40 cm



Configuration and control application

LIGHTING CONTROL

Management of lighting objectives and luminous intensity and control:

- wavelengths (up to 6)
- multi-lighting
- lighting duration
- spectroradiometer
- crop profiles
- crop groups
- datas (real time & historical)
- harvesting mode
- automatic management

DLI and PPFD control

CONSO ENERGY

Power and energy consumption by lighting group

LIGHTING / CONSUMPTION STATISTICS

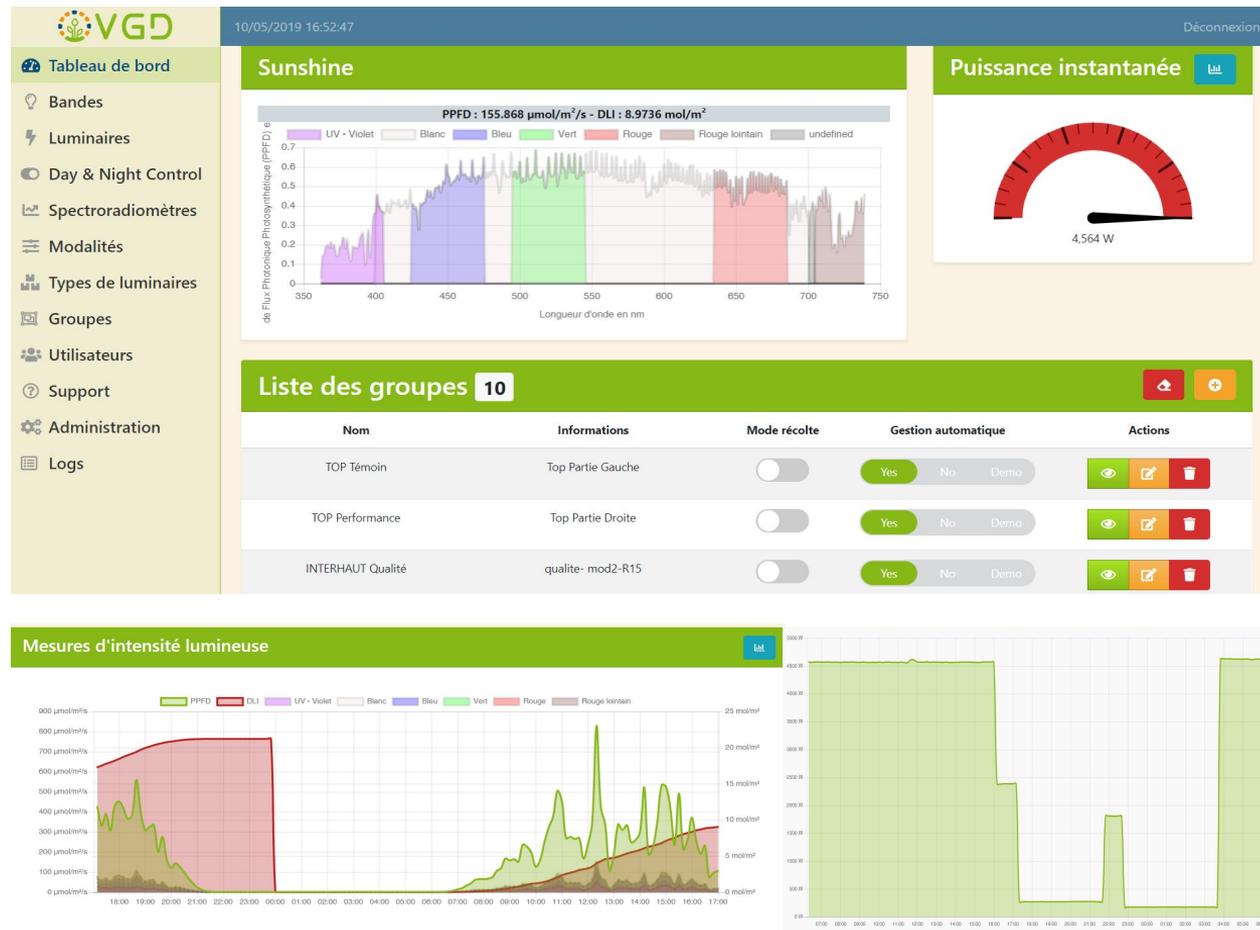
History and real time

ALARMS ALERT

Management of consumer alerts, growth, climate,...

DISTANT ACCESS

Local wired or remote access and Smartphone



Configuration and control

	Starter	Standard	Premium	
Lighting	Smart VGD controllable LEDs (real time, wavelength,...) with artificial intelligence	🍃	🍃	🍃
	Manage other lighting systems: on/off control of other lighting systems (sodium or market leds)		🍃	🍃
	Smart sensors : brightness sensors / spectroradiometer controlling real time brightness		🍃	🍃
	Climate forecasts (sun, heat, rainfall...)			on request
	Energy consumption: real-time energy consumption monitoring and statistics / historical data	🍃	🍃	🍃
Plant	Crop configuration: illumination profile by crop and growth cycle	🍃	🍃	🍃
	Plant growth management: sensors and statistical / growth history monitoring, alerts,...			🍃
	Monitoring other factors: interfacing with other factors (inputs, water, heating, air, humidity)			on request
	Training and consulting physiology & growth by experts		simple	on request



PLANT GROWTH + ARTIFICIAL INTELLIGENCE + LIGHTING

VGD involves its R&D teams and partners in artificial intelligence and plant growth to develop its own products or those of its customers for fundamental research, applied research or samples light system.

Some examples of research projects conducted through VGD :

- software and hardware solution for horticultural lighting control, integrating tomato and cucumber cultivation profiles,
- cultivation room for a European seed leader,
- lighting control with artificial intelligence for a European leader in lighting,
- model of an enlightened market stall for the conservation and growth of herbs.
- a growing room and pre-series for a world leader in input production,
- intelligent lighting system for the construction industry,
- egg-laying of soldier flies for the recovery of organic food waste,
- removal of beech dormancy for a research centre.



VGD, research tax credits approved also has a growing room near Avignon (south of France) for the follow-up of your projects or samples series



An assisted deployment of your project

Needs analysis

Audit of existing facilities, projects and infrastructures

Simulation of energy gains and financing solutions

Concrete measurement of your lighting and ways to optimize it

Material loan

Setup

Validation subject to tests

Standard or tailor-made solutions

Turnkey installation with recognized / local integrator

Available samples series

Training

Parameter setting by crop / plot / luminaire

Training in the VGD management tool

Phytosanitary training in partnership with CTIFL

Growth monitoring

Monitoring and assessment of your crops and energy

(Remote monitoring by VGD possible)

Adjustment of the model / culture profile after operations thanks to AI



The team

The team, based near Agroparc Avignon in south of France, is composed of engineers and technicians with complementary skills (plant eco-physiologists, agronomists, electronics engineers, programmers, opto-electronics), who have the same goal of offering you an innovative global solution, services, software and equipment dedicated mainly to the world of horticultural lighting. These solutions dedicated to the world of photosynthetic lighting are manufactured in France.

Team of founders



Sébastien Deprade
CEO & business development

Self-taught business manager in the intelligent lighting market



Nicolas Chauvin
Director of the Plant Division

Director of R&D in plant physiology



Guillaume Marie
Director of Engineering & Technology

Technical Director, Software Solutions and Design Office



Some customers talk about it !



"With the VGD solution I went from unsaleable tomato production to profitable and stable production"

Patrick Roux - Producer - 8 hectares Valence (FR)



"I gain 3 days over 2 weeks of raising my young plants. The plant is more compact, harder, the quality is controlled and regular, so transplanting becomes easier and recovery is better"

Julien Aubert, Saint-Rémy Basilic (FR)



"Photovoltaic greenhouse cultivation was very energy-intensive and the results disappointing. VGD technology has allowed me to make as much as with a traditional heated greenhouse but with a tastier production"

Philippe Ther
-Organic producer- Carpentras (FR)



When light boosts growth & taste!



Case study in real conditions on tomato cultivation - 12-week cycle Western France

Benefits

- 2 weeks on the first harvest
- + 3.5 weeks on last harvests
- Shortening of the flowering-harvest time
- 3.5 weeks on flowering
- x2 densification of crops with the same energy

Organoleptic properties

- +15% BRIX rate (sugar content)
- +15% firmness of the fruit
- +33% better flavours
- +40% sweet taste
- 44% off a water taste

+38%

efficiency (kg/sqm)
due to LED vs.
non-lit lighting

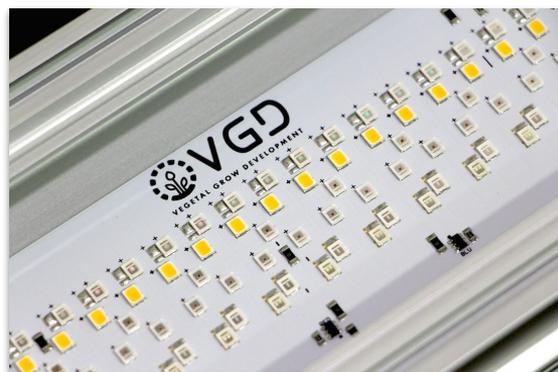
- 41%

Of electricity consumed
thanks to real-time control
(dynamic vs. fixed spectrum)

Ø impact

Impact on plant architecture
Chlorophyll content
Oxidative stress of photosystems





More information
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