

Scenario

Select a scenario...

System Input

Optimization Target

Photon Flux

Led Count

Target Photon Flux (μmol/s) per Luminaire

1000

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10,00	100,00	23	AR (700 mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900,00	206	VM (700 mA)

System Properties

Solder Point Temperature (°C)

Optical Efficiency (%)

Electrical Efficiency (%)

65

90

90

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire length (mm)

300

Luminaire width (mm)

300

LED Gap (x-axis) (mm)

16

LED Gap (y-axis) (mm)

15

Greenhouse Setup

Top Lighting

Distance Luminaire to plant area (m)

Plant Area length (m)

Plant Area width (m)

Number of luminaires

Luminaire Gap (x) (m)

Luminaire Gap (y) (m)

65

90

90

388.3

1,002.8

2.58

83.3

0.71

1,000.39

2.58

System Output

Color	Product	Photon Flux Ratio (%)	LED Quantity per Luminaire	Photon Flux per Luminaire (μmol/s)	Photosynthetic Photon Flux per Luminaire (μmol/s)	Radiant Flux per Luminaire (W)
Deep Blue (439-461 nm)	GD CSSRM2.14	10.0	23	100.6	100.2	26.7
Hyper Red (635-666 nm)	GH CSSRM2.24	90.0	206	902.2	900.2	164.8
Summary		100.0	229	1,002.8	1,000.4	191.5

System Summary

Solder Point Temperature (°C)

Optical Efficiency (%)

Electrical Efficiency (%)

Luminaire Power Consumption (W)

65

90

90

388.3

Photon Flux (PF) based evaluation (360 - 780 nm)

Luminaire Photon Flux (PF) (μmol/s)

Luminaire Efficiency (PF) (μmol/l)

Average Photon Flux Density (PFD) on plant area (μmol/s/m²)

Uniformity on plant area (PFDmin / PFDmax)

1,002.8

2.58

83.3

0.71

Photosynthetic Photon Flux (PPF) based evaluation (400-700 nm)

Luminaire Photosynthetic Photon Flux (PPF) (μmol/s)

Luminaire Efficacy (PPF) (μmol/l)

1,000.39

2.58

System Graphics

System 3D

Spectral Distribution

☒ LED Spectra

☒ Beta Carotene

☒ Chlorophyll A

☒ Chlorophyll B

☐ PPF

☐ PFD

☐ Photosynthetic PFD

☐ Photosynthetic PFD

Distance of luminaire to PFD false color map (m)

69.67

97.71

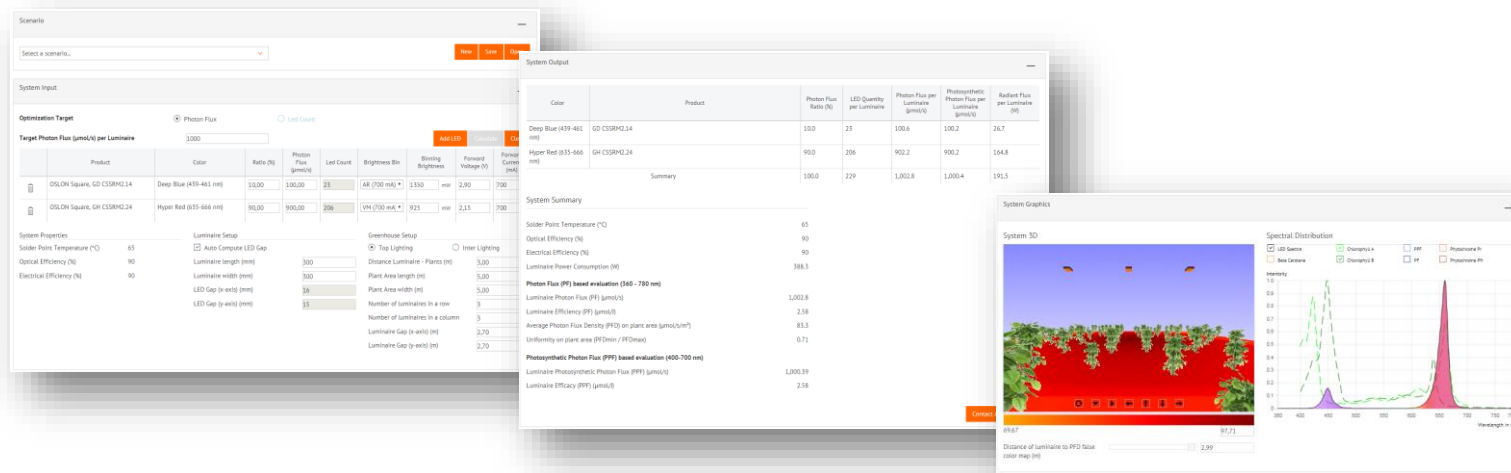
2.99

Horticulture Lighting Web Tool

OS GL S EEM | 2018 | Regensburg
Light is OSRAM

Welcome to the horticulture lighting web tool from OSRAM OS

The horticulture lighting web tool allows an easy estimation of the necessary number of LEDs to achieve a target photon flux and gives a first indication on the photon flux density by an irradiance estimation of multiple fixtures.



Please be aware:

The calculations in this horticulture tool are based on mathematical methods and approximations using typical characteristics and values! Variations between real systems and calculation results are possible! Please always verify the final design with a real prototype!

Overview

1. How to log in to the system?
 2. How to load a scenario and what are the basic sections of the tool?
 3. How to create your own scenario?
-

How can I log in to the horticulture web tool?

In order make full use of the horticulture web tool you can register and log into the MyOSRAM.com portal. www.myosram.com

The screenshot shows the MyOSRAM.com portal interface. At the top, the OSRAM logo is on the left. To its right is a language dropdown menu set to 'English' and a login section with 'Email' and 'Password' input fields and a 'Log On' button. Below the header, a banner area contains the text 'Welcome to myOSRAM.com - Your information and shopping portal'. The main content area features a dark background with a grid of orange icons representing various services like a lightbulb, a padlock, a magnifying glass, an information icon, a Euro symbol, an email icon, an LED chip, a download arrow, a shopping cart, and a folder. Below this grid are three orange buttons: a lock icon, a document icon, and a gear icon. The document icon is highlighted with a red box and a callout that says 'Create your account by registering here'. Below the buttons, there is a section for 'Lost password? Trouble with logon?' with links for 'Forgot Password' and 'Trouble with logon?'. A callout points to the 'Forgot Password' link with the text 'Reset your password'. Another callout points to the 'Log On' button with the text 'Login to the MyOSRAM.com Portal'. A third callout points to the language dropdown with the text 'Set your language'.

Set your language

Create your account by registering here

Login to the MyOSRAM.com Portal

Reset your password

Why should I register and login to the tool?

First you should Login to the tool to use all functionalities. Basic calculations are available also without Login.

Application Note

Contact AE

Login

Scenario

Select a scenario...

New Save Open

System Input

Optimization Target

Photon Flux

Led Count

Target Photon Flux (μmol/s) per Luminaire

1000

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10,00	100,00	23	AR (700 mA)	1350 mW	2,90	700
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900,00	206	VM (700 mA)	925 mW	2,15	700

System Properties

Solder Point Temperature (°C)

65

Optical Efficiency (%)

90

Electrical Efficiency (%)

90

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire length (mm)

300

Luminaire width (mm)

300

LED Gap (x-axis) (mm)

16

LED Gap (y-axis) (mm)

15

Greenhouse Setup

☒ Top Lighting

☐ Inter Lighting

Distance Luminaire - Plants (m)

3,00

Plant Area length (m)

5,00

Plant Area width (m)

5,00

Number of luminaires in a row

3

Number of luminaires in a column

3

Luminaire Gap (x-axis) (m)

2,70

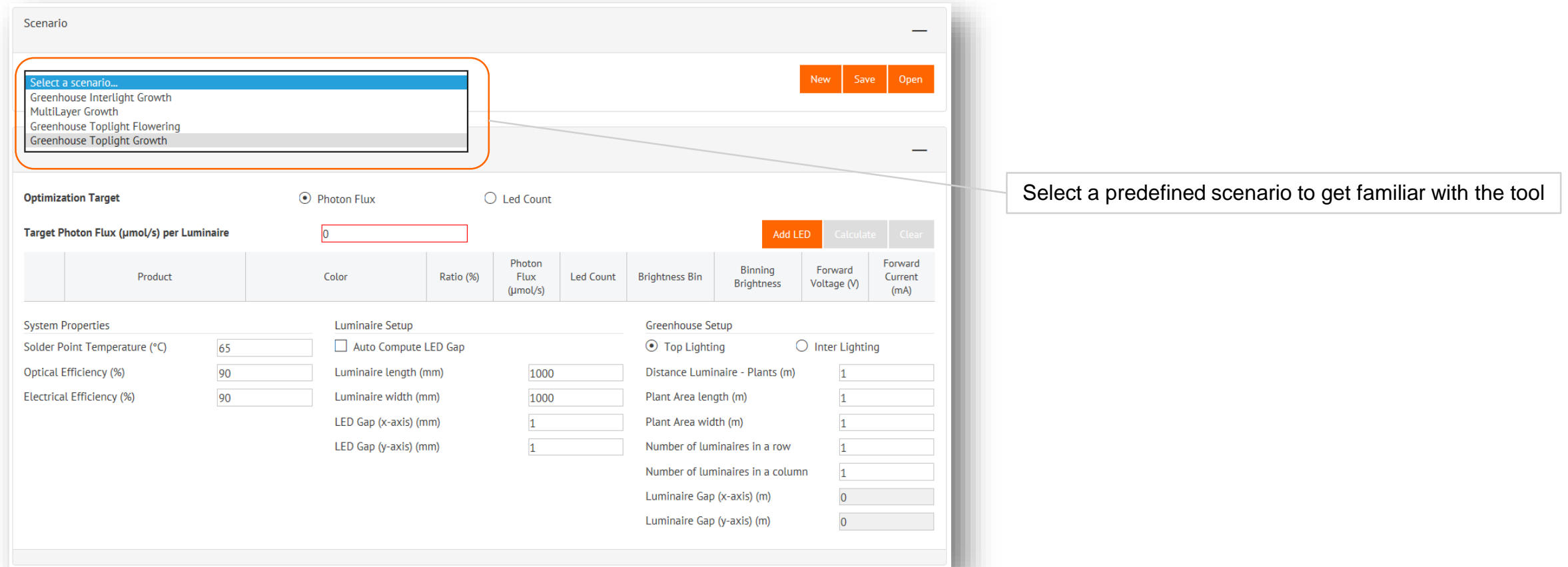
Luminaire Gap (y-axis) (m)

2,70

Function	Open	Login required
Basic calculation	Yes	Yes
Change solder point temperature Ts	No	Yes
Change optical efficiency	No	Yes
Change electrical efficiency	No	Yes
Set individual LED counts	No	Yes
Save and load scenarios	No	Yes

How can I load a predefined scenario?

The easiest way to start with the Horticulture Lighting Web Tool is to load a predefined scenario and change some properties to get used to the parameters and functions.



The screenshot shows the Horticulture Lighting Web Tool interface. A callout box points to the 'Select a scenario...' dropdown menu, which lists four predefined scenarios: 'Greenhouse Interlight Growth', 'MultiLayer Growth', 'Greenhouse Toplight Flowering', and 'Greenhouse Toplight Growth'. The 'New', 'Save', and 'Open' buttons are visible in the top right corner of the scenario selection area.

Optimization Target

☒ Photon Flux ☐ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
System Properties									
Solder Point Temperature ($^{\circ}\text{C}$)	<input type="text" value="65"/>								
Optical Efficiency (%)	<input type="text" value="90"/>								
Electrical Efficiency (%)	<input type="text" value="90"/>								
Luminaire Setup									
	<input type="checkbox"/> Auto Compute LED Gap								
Luminaire length (mm)	<input type="text" value="1000"/>								
Luminaire width (mm)	<input type="text" value="1000"/>								
LED Gap (x-axis) (mm)	<input type="text" value="1"/>								
LED Gap (y-axis) (mm)	<input type="text" value="1"/>								
Greenhouse Setup									
	<input checked="" type="radio"/> Top Lighting <input type="radio"/> Inter Lighting								
Distance Luminaire - Plants (m)	<input type="text" value="1"/>								
Plant Area length (m)	<input type="text" value="1"/>								
Plant Area width (m)	<input type="text" value="1"/>								
Number of luminaires in a row	<input type="text" value="1"/>								
Number of luminaires in a column	<input type="text" value="1"/>								
Luminaire Gap (x-axis) (m)	<input type="text" value="0"/>								
Luminaire Gap (y-axis) (m)	<input type="text" value="0"/>								

What are the different sections of the tool?

The tool is structured in 3 sections:

System Input

System Input

Optimization Target

Photon Flux

LED Count

Target Photon Flux (μmol/s) per Luminaire

700

Calculate

Clear

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90	630	141	VH (700 mA)	925 mW	2.15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10	70	16	AR (700 mA)	1350 mW	2.9	700

System Properties

Solder Point Temperature (°C)

65

Optical Efficiency (%)

92

Electrical Efficiency (%)

92

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire length (mm)

1000

Luminaire width (mm)

200

LED Gap (x-axis) (mm)

33

LED Gap (y-axis) (mm)

26

Greenhouse Setup

Top Lighting

Inter Lighting

Distance Luminaire - Plants (m)

3

Plant Area length (m)

6

Plant Area width (m)

6

Number of luminaires in a row

3

Number of luminaires in a column

3

Luminaire Gap (x-axis) (m)

2

Luminaire Gap (y-axis) (m)

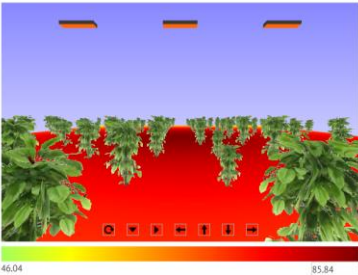
2

Here you can configure the complete system from the LEDs, the luminaire properties to the greenhouse setup

System Graphics

System Graphics

System 3D



46.04

85.84

Distance of luminaire to PFD false color map (m)

2.99

Spectral Distribution

☒ LED Spectra

☒ Beta Carotene

☒ Chlorophyll A

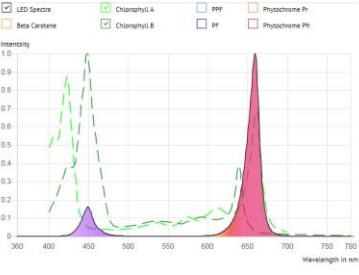
☒ Chlorophyll B

☐ PPF

☐ PP

☐ Phytochrome Pr

☐ Phytochrome Pfr



Here you can see a graphical illustration of the system setup and a false color map of the PFD distribution as well as the spectral composition of solution

System Output

System Output

Color	Product	Photon Flux Ratio (%)	LED Quantity per Luminaire	Photon Flux per Luminaire (μmol/s)	Photosynthetic Photon Flux per Luminaire (μmol/s)	Radiant Flux per Luminaire (W)
Hyper Red (635-666 nm)	GH CSSRM2.24	90.0	141	631.2	629.9	115.3
Deep Blue (439-461 nm)	GD CSSRM2.14	10.0	16	71.5	71.2	19.0
Summary		100.0	157	702.8	701.1	134.3

System Summary

Solder Point Temperature (°C)

65

Optical Efficiency (%)

92

Electrical Efficiency (%)

92

Luminaire Power Consumption (W)

260.6

Photon Flux (PPF) based evaluation (360 - 780 nm)

Luminaire Photon Flux (PPF) (μmol/s)

702.8

Luminaire Efficiency (PPF) (μmol/l)

2.70

Average Photon Flux Density (PPFD) on plant area (μmol/s/m²)

69.4

Uniformity on plant area (PPFDmin / PPFDmax)

0.53

Photosynthetic Photon Flux (PPF) based evaluation (400-700 nm)

Luminaire Photosynthetic Photon Flux (PPF) (μmol/s)

701.10

Luminaire Efficacy (PPF) (μmol/l)

2.69

Contact AE

Export

Here you will find the calculation results for the fixture and the complete illumination scene

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Horticulture Web Tool – Tutorial and Manual | OS GL S EEM | AW CH
December 2018

OSRAM

Opto Semiconductors

Lets get started! Login to the tool and do your first calculations ...

Start your calculations either by entering your target photon flux in $\mu\text{mol/s}$ from the luminaire, or selecting your first LED.

Scenario

System Input

Optimization Target

☒ Photon Flux ☐ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire

Add LED

Calculate

Clear

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
System Properties									
Solder Point Temperature ($^{\circ}\text{C}$)	<input type="text" value="65"/>								
Optical Efficiency (%)	<input type="text" value="90"/>								
Electrical Efficiency (%)	<input type="text" value="90"/>								
Luminaire Setup									
<input type="checkbox"/> Auto Compute LED Gap									
	Luminaire length (mm)		<input type="text" value="1000"/>						
	Luminaire width (mm)		<input type="text" value="1000"/>						
	LED Gap (x-axis) (mm)		<input type="text" value="1"/>						
	LED Gap (y-axis) (mm)		<input type="text" value="1"/>						
Greenhouse Setup									
<input checked="" type="radio"/> Top Lighting <input type="radio"/> Inter Lighting									
	Distance Luminaire - Plants (m)			<input type="text" value="1"/>					
	Plant Area length (m)			<input type="text" value="1"/>					
	Plant Area width (m)			<input type="text" value="1"/>					
	Number of luminaires in a row			<input type="text" value="1"/>					
	Number of luminaires in a column			<input type="text" value="1"/>					
	Luminaire Gap (x-axis) (m)			<input type="text" value="0"/>					
	Luminaire Gap (y-axis) (m)			<input type="text" value="0"/>					

Product Selector

Color

Brand

SubBrand

SubSubBrand

Device *

Select

Reset

Cancel

* Mandatory Input

Select your LEDs ...

Select your LEDs in the Product Selector dialog “Add LED”:

You can select a LED type by starting from the color and select the brand, sub brand and finally the device

Product Selector

Color	Hyper Red (635-666 n) ▼
Brand	OSLON ▼
SubBrand	Square ▼
SubSubBrand	NA ▼
Device *	<input type="text"/> GH CSSRM2.24

* Mandatory Input

Select Reset Cancel

If you know the LED type you can select the LED directly by typing into the device field

Product Selector

Color	<input type="text"/> ▼
Brand	<input type="text"/> ▼
SubBrand	<input type="text"/> ▼
SubSubBrand	<input type="text"/> ▼
Device *	<input type="text"/> gh css GH CSSPM1.24 GH CSSRM2.24

* Mandatory Input

Select Reset Cancel

Set the your photon flux ratio for the different LEDs ...

Usually the spectrum of horticulture fixtures are requiring certain ratios for different wavelength ranges. Set the target ratio in % for the wavelength range generated by the LED.

In this example we want 90% of the $\mu\text{mol/s}$ coming from the Hyper Red 660nm LED and 10% of the $\mu\text{mol/s}$ from the Deep Blue 450nm LED. You can also enter the photon flux per color directly.

If the sum is larger than 100% for all LEDs the tool will show a red error message and ask to reduce either the ratio or the photon flux. A mouse over will show you the maximum available ratio left.

System Input

Optimization Target ☒ Photon Flux ☐ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900	196	VN (700 mA)	972,5 mW	2,15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10,00	100	21	AS (700 mA)	1470 mW	2,9	700

System Properties

Solder Point Temperature ($^{\circ}\text{C}$)

Optical Efficiency (%)

Electrical Efficiency (%)

Luminaire Setup

☐ Auto Compute LED Gap

Luminaire length (mm)

Luminaire width (mm)

LED Gap (x-axis) (mm)

LED Gap (y-axis) (mm)

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

Plant Area length (m)

Plant Area width (m)

Number of luminaires in a row

Number of luminaires in a column

Luminaire Gap (x-axis) (m)

Luminaire Gap (y-axis) (m)

System Input

Optimization Target ☒ Photon Flux ☐ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire Add LED Calculate Clear

The sum of the ratio: 110% (photon flux : 1100) $\mu\text{mol/s}$ is to high. Decrease the ratio by 10% or the Photon Flux by 100 $\mu\text{mol/s}$

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900	196	VN (700 mA)	972,5 mW	2,15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	20,00	200	42	AS (700 mA)	1470 mW	2,9	700

System Properties

Solder Point Temperature ($^{\circ}\text{C}$)

Optical Efficiency (%)

Electrical Efficiency (%)

Luminaire Setup

☐ Auto Compute LED Gap

Luminaire length (mm)

Luminaire width (mm)

LED Gap (x-axis) (mm)

LED Gap (y-axis) (mm)

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

Plant Area length (m)

Plant Area width (m)

Number of luminaires in a row

Number of luminaires in a column

Luminaire Gap (x-axis) (m)

Luminaire Gap (y-axis) (m)

Instead of an automatic calculation of the LED count you can set a specific amount of LEDs per type

Usually the LED count is calculated automatically to meet the requested $\mu\text{mol/s}$ ratio for the different wavelength and LED types. This can be used as a first indication. Afterwards you can also set the number of LED to meet your electrical and geometrical requirements on the PCB.

System Input

Optimization Target ☐ Photon Flux ☒ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	95.05	875.2	<input type="text" value="190"/>	VN (700 mA)	972.5 mW	2.15	700
	OSLON SSL 120, GD CSSPM1.14	Deep Blue (439-461 nm)	4.94	45.53	<input type="text" value="20"/>	UO (350 mA)	687.5 mW	2.85	350

System Properties

Solder Point Temperature ($^{\circ}\text{C}$)

Optical Efficiency (%)

Electrical Efficiency (%)

Luminaire Setup

☐ Auto Compute LED Gap

Luminaire length (mm)

Luminaire width (mm)

LED Gap (x-axis) (mm)

LED Gap (y-axis) (mm)

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

Plant Area length (m)

Plant Area width (m)

Number of luminaires in a row

Number of luminaires in a column

Luminaire Gap (x-axis) (m)

Luminaire Gap (y-axis) (m)

Select the LED Count option to enable the LED count fields in the input area

Set the number of LEDs for the different LED types. The photon flux ratio and value will be recalculated based on your inputs.

Adjust the brightness bin, the brightness at binning conditions, the forward voltage and the forward current if necessary ...

Reasonable values for brightness, Vf and If are chosen by default. Please review the values so they match to your requirements and system.

System Input

Optimization Target

☒ Photon Flux ☐ Led Count

Target Photon Flux (μmol/s) per Luminaire

1000

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900,00	196	VN (700 mA)	972,5 mW	2,15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10,00	100,00	21	AS (700 mA)	1470 mW	2,9	700

System Properties

Solder Point Temperature (°C)

65

Optical Efficiency (%)

90

Electrical Efficiency (%)

90

Luminaire Setup

☐ Auto Compute LED Gap

Luminaire length (mm)

1000

Luminaire width (mm)

1000

LED Gap (x-axis) (mm)

1

LED Gap (y-axis) (mm)

1

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

1

Plant Area length (m)

1

Plant Area width (m)

1

Number of luminaires in a row

1

Number of luminaires in a column

1

Luminaire Gap (x-axis) (m)

0

Luminaire Gap (y-axis) (m)

0

Set the brightness and forward voltage under binning conditions.

Adjust the forward current to the application conditions. A reduced forward current can increase the efficiency of the system significantly

Adjust the fixture properties to your system setup

The solder point temperature and the optical and electrical efficiencies have significant influence to fixture performance.

The solder point temperature can be measured on the PCB and next to the LED. It strongly depends on the thermal management, the power consumption and the ambient temperature. A thermal simulation or calculation can help to get a reasonable starting point. It should always be checked with a first prototype.

Adjust the optical and electrical efficiency of the complete system to consider the losses in the optical system e.g. lenses or cover glass and the losses in the LED driver.

System Input

Optimization Target

☒ Photon Flux ☐ Led Count

Target Photon Flux ($\mu\text{mol/s}$) per Luminaire

1000

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux ($\mu\text{mol/s}$)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90,00	900,00	196	VN (700 mA)	972,5 mW	2,15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10,00	100,00	21	AS (700 mA)	1470 mW	2,9	700

System Properties

Solder Point Temperature ($^{\circ}\text{C}$)

65

Optical Efficiency (%)

90

Electrical Efficiency (%)

90

Luminaire Setup

☐ Auto Compute LED Gap

Luminaire length (mm)

1000

Luminaire width (mm)

1000

LED Gap (x-axis) (mm)

1

LED Gap (y-axis) (mm)

1

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

1

Plant Area length (m)

1

Plant Area width (m)

1

Number of luminaires in a row

1

Number of luminaires in a column

1

Luminaire Gap (x-axis) (m)

0

Luminaire Gap (y-axis) (m)

0

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December 2018

OSRAM
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Specify the size of the luminaire or fixture and get a feeling of the gap between the LEDs

The size of the luminaire has an impact on the illumination simulation and allows also an indication on the gap between the LEDs on the PCB.

System Input

Optimization Target

☒ Photon Flux ☐ Led Count

Target Photon Flux (μmol/s) per Luminaire

1000

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GH CSSRM2.24	Hyper Red (635-666 nm)	90.00	900.00	196	VN (700 mA)	972.5 mW	2.15	700
	OSLON Square, GD CSSRM2.14	Deep Blue (439-461 nm)	10.00	100.00	21	AS (700 mA)	1470 mW	2.9	700

System Properties

Solder Point Temperature (°C)

65

Optical Efficiency (%)

90

Electrical Efficiency (%)

90

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire Length (mm)

300

Luminaire width (mm)

300

LED Gap (x-axis) (mm)

16

LED Gap (y-axis) (mm)

16

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

1

Plant Area length (m)

1

Plant Area width (m)

1

Number of luminaires in a row

1

Number of luminaires in a column

1

Luminaire Gap (x-axis) (m)

0

Luminaire Gap (y-axis) (m)

0

Ensure that the “Auto Compute LED Gap” box is checked

Enter the size of the luminaire in mm

The system will calculate the gap between the LEDs based on the number of LEDs used in the fixture.
If the fixture is too small for the amount of LEDs a error message will be displayed.

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire Length (mm)

300

Luminaire width (mm)

15

LED Gap (x-axis) (mm)

Please enter a value

LED Gap (y-axis) (mm)

Please enter a value

Not enough space for LEDs.

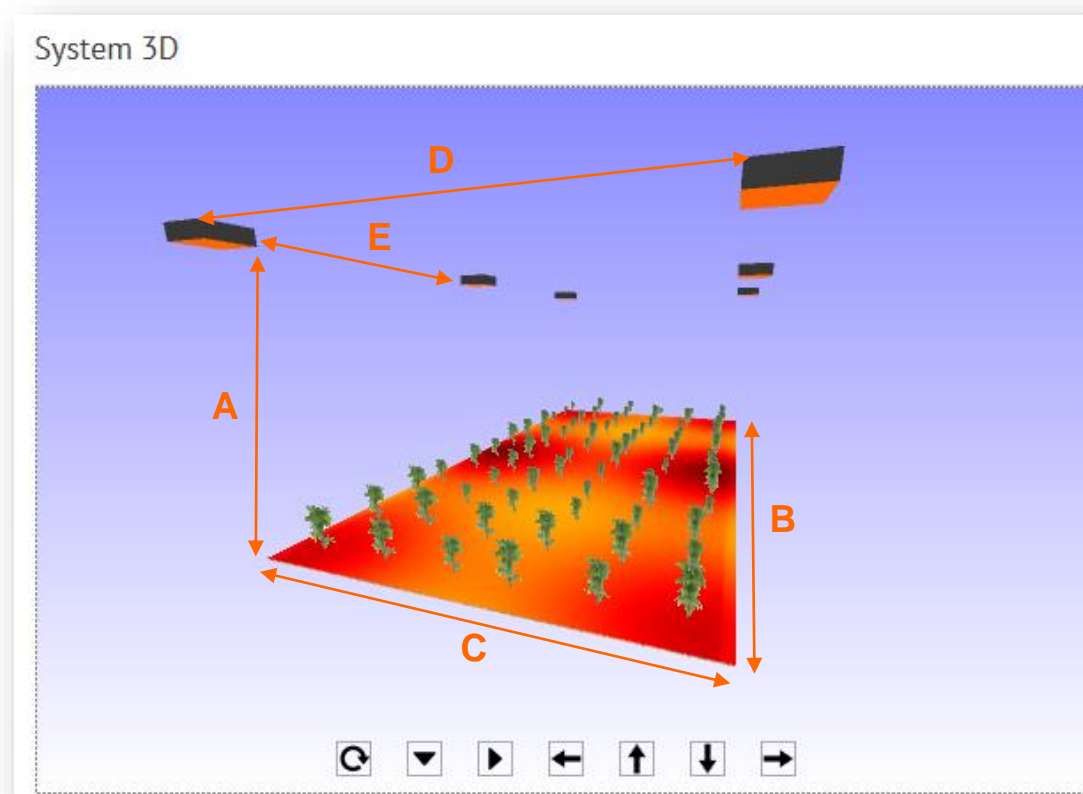
Specify the size of the Greenhouse and Plant Area Setup

In the Greenhouse Setup area you can define the illumination setup with the size of the plant area, the distance of the fixtures to the plants, the number of luminaires and the positioning.

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)	2.00	A
Plant Area length (m)	3.00	B
Plant Area width (m)	6.00	C
Number of luminaires in a row	2	
Number of luminaires in a column	3	
Luminaire Gap (x-axis) (m)	2.70	D
Luminaire Gap (y-axis) (m)	2.70	E



Start the calculation!

Whenever you change some values in the System Input area you are changing the setup and a new calculation of the setup is necessary.

Add LED

Calculate

Clear

Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
VN (700 mA)	972.5 mW	2.15	700
AS (700 mA)	1470 mW	2.9	700

Greenhouse Setup

☒ Top Lighting

☐ Inter Lighting

Distance Luminaire - Plants (m)

2.00

Plant Area length (m)

3.00

Plant Area width (m)

6.00

Number of luminaires in a row

2

Number of luminaires in a column

3

Luminaire Gap (x-axis) (m)

1.00

Luminaire Gap (y-axis) (m)

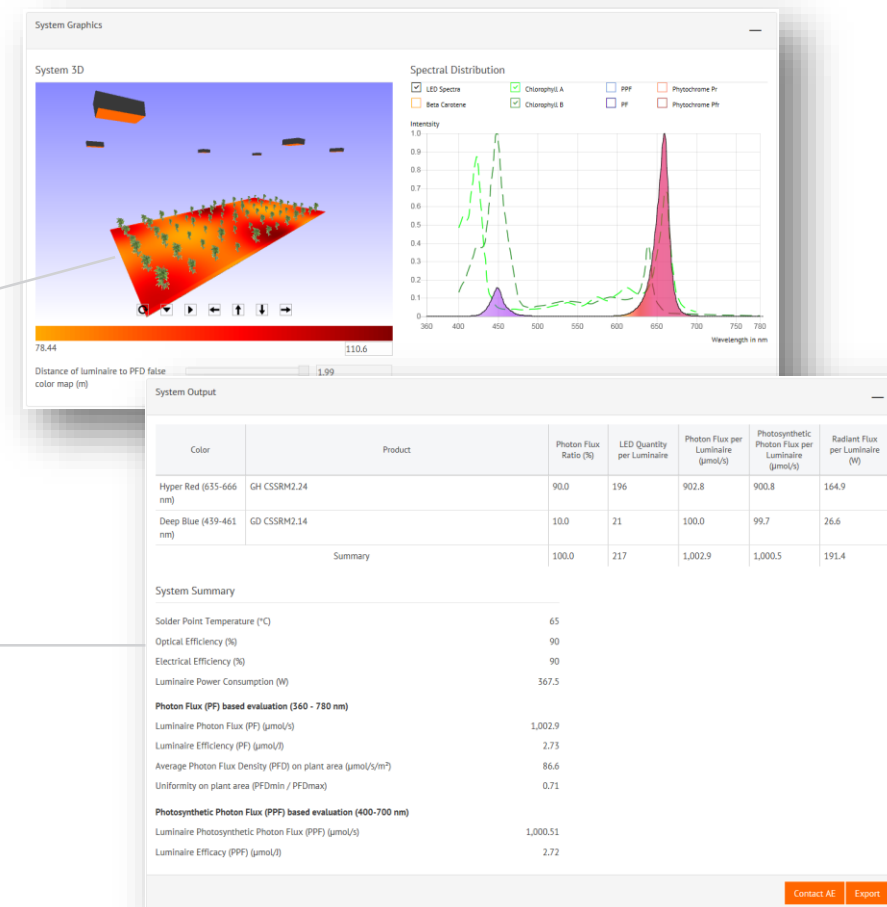
2.70

Press the Calculate Button to start the processing

If you want to start a new System press the Clear Button

After the processing you will get:

- 3D System representation of the setup including a false color map of the photon flux density (PFD) distribution
- A visualization of the spectral composition relative to typical plant characteristics
- A detailed breakdown of the complete system performance and parameters for the fixture and the system setup



Reviewing the calculation results of the system setup in the “System Graphics” area – the 3D representation

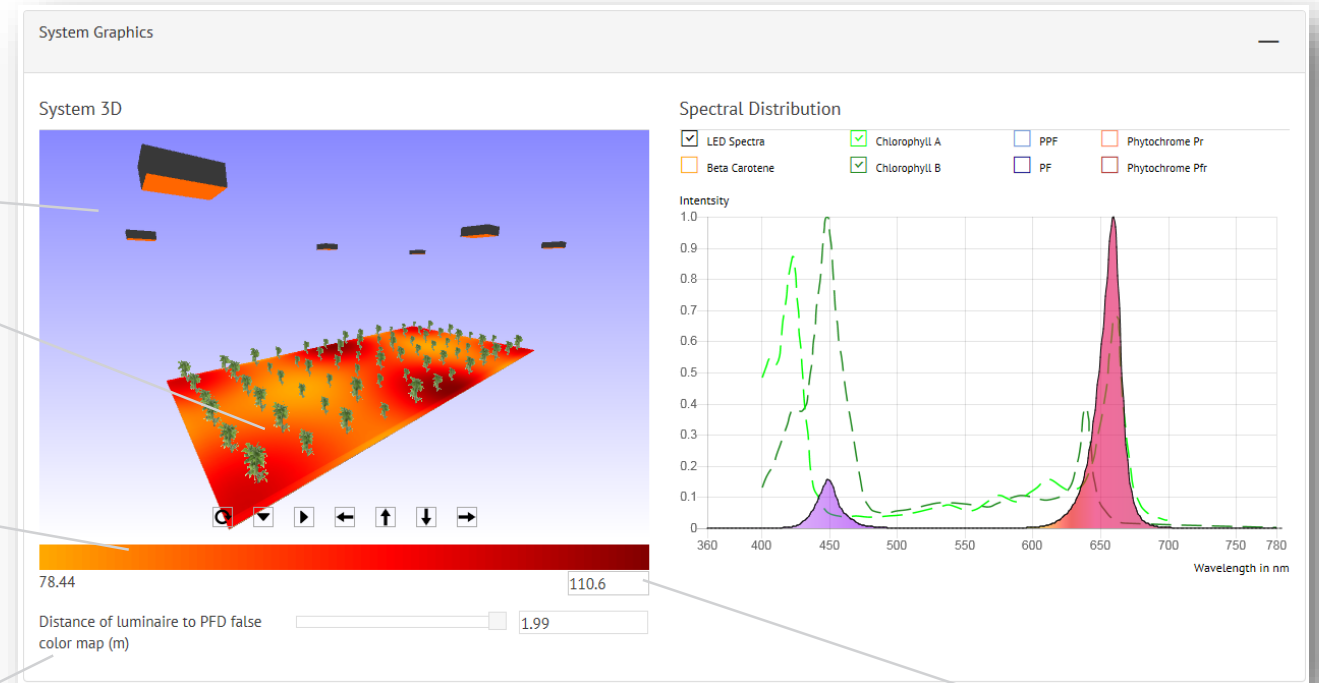
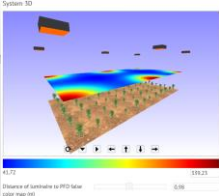
The System 3D window gives you a visual overview of the system setup.

The System 3D window shows a visualization of the Greenhouse setup

The false color map gives you a rough indication on the Photon Flux Density (PPFD) in $\mu\text{mol/s/m}^2$. This is a rough estimation based on the radiation characteristic of the LED only and should be confirmed by a more detailed system simulation based on the final design of the fixture! (e.g. DIALUX, RELUX, ...)

The false color map will also show the minimum and maximum value of the PPFD within the plant area

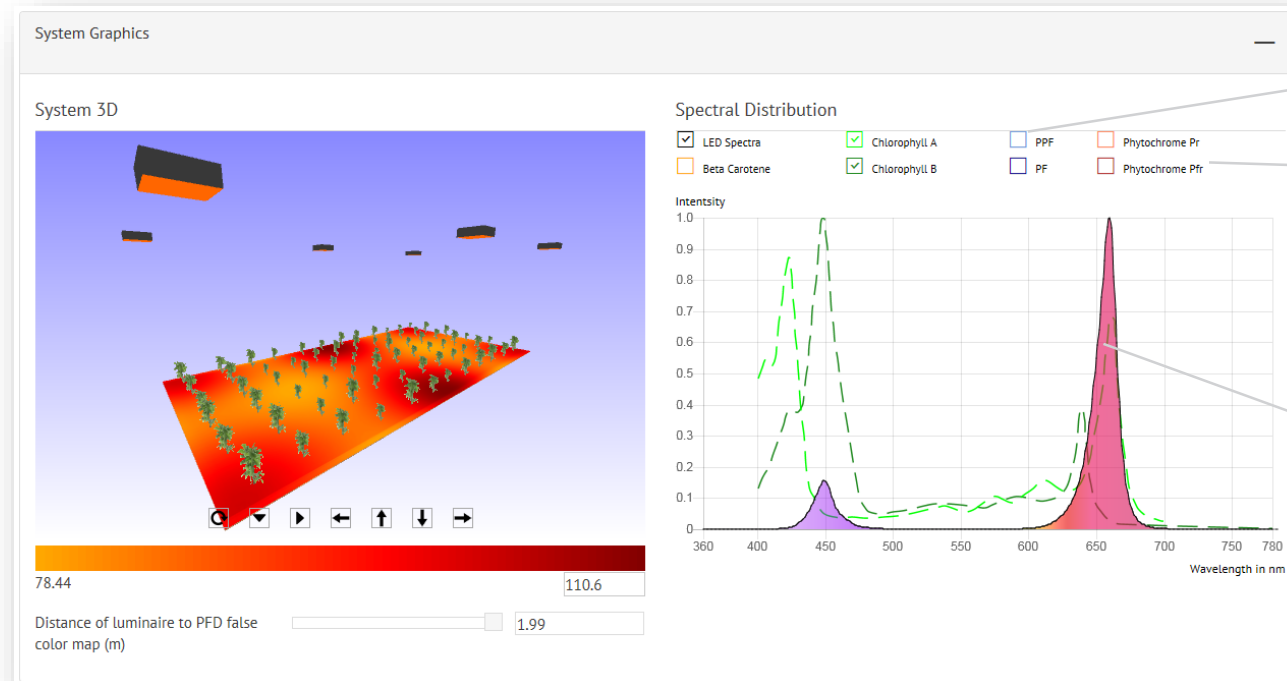
You can change the distance of the evaluation from the plant area (default) closer to the fixtures to evaluate the uniformity at different distances



You can change the scaling of the false color map by adjusting the maximum value in order to evaluate the uniformity

Reviewing the calculation results of the system setup in the “System Graphics” area – the spectral data

The Spectral Distribution window shows the resulting mixed spectral composition of the light in respect to typical plant characteristics.



You can view the PPF range (400-700nm) or the complete PF range from 360-780nm in this tool.

You can select and deselect different typical plant characteristics to evaluate the match of the spectrum to the targeted sensitivity curves.

The resulting mixed spectrum from the fixture is displayed

Reviewing the calculation results of the system setup: The System Output

The System Output area gives you the typical parameters for one fixture.

System Output

Color	Product	Photon Flux Ratio (%)	LED Quantity per Luminaire	Photon Flux per Luminaire (μmol/s)	Photosynthetic Photon Flux per Luminaire (μmol/s)	Radiant Flux per Luminaire (W)
Hyper Red (635-666 nm)	GH CSSRM2.24	90.0	196	902.8	900.8	164.9
Deep Blue (439-461 nm)	GD CSSRM2.14	10.0	21	100.0	99.7	26.6
Summary		100.0	217	1,002.9	1,000.5	191.4

System Summary

Solder Point Temperature (°C)	65
Optical Efficiency (%)	90
Electrical Efficiency (%)	90
Luminaire Power Consumption (W)	367.5
Photon Flux (PF) based evaluation (360 - 780 nm)	
Luminaire Photon Flux (PF) (μmol/s)	1,002.9
Luminaire Efficiency (PF) (μmol/J)	2.73
Average Photon Flux Density (PFD) on plant area (μmol/s/m²)	86.6
Uniformity on plant area (PFDmin / PFDmax)	0.71
Photosynthetic Photon Flux (PPF) based evaluation (400-700 nm)	
Luminaire Photosynthetic Photon Flux (PPF) (μmol/s)	1,000.51
Luminaire Efficacy (PPF) (μmol/J)	2.72

Contact AE

Export

Overview of the LED types used in the fixture, the amount of LEDs, the generated PF, PPF and optical power of each individual LED type.

In the System Summary you get information on the selected solderpoint temperature, optical and electrical efficiency and total power consumption of the fixture.

The calculation is always targeting Photon Flux (PF) in the complete range from 360-780nm. The results in this range for Photon Flux, Photon Flux Efficacy, average Photon Flux Density and uniformity at the plant area.

If the results for the Photosynthetic Photon Flux (PPF) is required the section below is giving the results for PPF and PPF Efficacy.

Creating a Summary Report of the simulation as PDF

In order to send the simulation results also to other persons you can save the configuration and results in a PDF report.

If you encounter problems, don't hesitate to tell us! Just drop us an email by pressing the Contact AE button.

Photon Flux (PF) based evaluation (360 - 780 nm)		
Luminaire Photon Flux (PF) (μmol/s)		1,002.9
Luminaire Efficiency (PF) (μmol/J)		2.73
Average Photon Flux Density (PFD) on plant area (μmol/s/m²)		86.6
Uniformity on plant area (PFDmin / PFDmax)		0.71
Photosynthetic Photon Flux (PPF) based evaluation (400-700 nm)		
Luminaire Photosynthetic Photon Flux (PPF) (μmol/s)		1,000.51
Luminaire Efficacy (PPF) (μmol/J)		2.72

Solution name: Solution
First name: First name
Last name: Last name

Date: 05.12.2018
Email: Email
User-ID: User-ID

Horticulture lighting system calculation

This document summarizes your horticulture lighting system solution. It is containing all calculated values, an illustration of the system and some information about the used LEDs. Please always verify the final design with a real prototype.

Please read the following and accept the terms and conditions to continue.

OSRAM assumes neither warranty, nor guarantee nor any other liability of any kind for the contents and correctness of the provided data. The data has been generated with highest diligence but may in reality not represent the complete possible variation range of all component parameters. Therefore, in certain cases a deviation between the real optical, thermal, electrical behaviour and the characteristics which are encoded in the provided data could occur. OSRAM reserves the right to undertake technical changes of the component without further notification which could lead to changes in the provided data. OSRAM assumes no liability of any kind for the loss of data or any other damage resulting from the usage of the provided data. The user agrees to this disclaimer and user agreement with the download or usage of the provided files.

<https://www.osram-os.com/horticulture/>

System Input: Solution

Color	Product	Photon Flux Ratio	Photon Flux	Binning	Forward Voltage	Forward Current
Hyper Red (635-666 nm)	GH CSSRM2-24	90 %	900 μmol/s	972.5 mW	2.15 V	700 mA
Deep Blue (435-461 nm)	GD CSSRM2-14	10 %	100 μmol/s	1470 mW	2.9 V	700 mA

System Properties

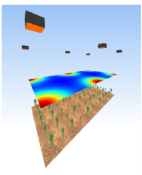
Solder Point Temperature	85 °C
Optical Efficiency	90 %
Electrical Efficiency	90 %

Luminaire Setup

Luminaire Length	300 mm
Luminaire Width	300 mm
LED gap (x-axis)	15.9 mm
LED gap (y-axis)	15.9 mm

Greenhouse Setup

Plant Area	1 m²
Plant Area Width	1 m
Plant Area Height	1 m
Number of Luminaires in a row (pcs)	2
Number of Luminaires in a column (pcs)	2
Luminaire Gap	2.7027 m



OSRAM Opto Semiconductors

Solution name: <solution name>
First name: <First name>
Last name: <Last name>

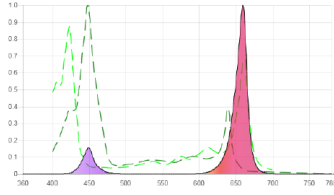
Date: <Date>
Email: <Email>
User-ID: <User-ID (SID)>

System Output

Color	Product	Photon Flux Ratio	Photon Quantity	Photon Flux	Photosynthetic Photon Flux	Radiant Flux
Hyper Red (635-666 nm)	GH CSSRM2-24	90 %	196 pcs	900 μmol/s	900 μmol/s	165 W
Deep Blue (435-461 nm)	GD CSSRM2-14	10 %	21 pcs	100 μmol/s	100 μmol/s	27 W
Summary		100 %	217 pcs	1000 μmol/s	1000 μmol/s	191 W

Spectral Distribution

- Beta Carotene
- Chlorophyll A
- Chlorophyll B
- PPF
- BPF
- Phytochrome Pr
- Phytochrome Pfr



System output of one luminaire		System output for the plant area	
Luminaire Photon Flux	1000	Average Photon Flux Density	87

OSRAM Opto Semiconductors

Solution name: <solution name>
First name: <First name>
Last name: <Last name>

Date: <Date>
Email: <Email>
User-ID: <User-ID (SID)>

	μmol/s	(PFD) on plant area	μmol/m²
Luminaire Photon Flux Efficacy (360-780nm)	2.73 μmol/J	Uniformity on plant area (PFDmin/PFDmax)	0.71
Luminaire Photosynthetic Photon Flux (400-700nm)	1000 μmol/s	Maximum Photon Flux Density (PFD) on plant area	41.72 μmol/m²
Luminaire Photosynthetic Photon Flux Efficacy (400-700nm)	2.72 μmol/J	Maximum Photon Flux Density (PFD) on plant area	539.23 μmol/m²
Luminaire Power Consumption	368 W		

OSRAM Opto Semiconductors

You can create a PDF report with all the system settings by pressing the Export Button

Save your work for later review or modification

You can save your solution for later use and load if for modifications.

Scenario

Select a scenario...

System Input

Optimization Target

Photon Flux ☒ Led Count ☐

Target Photon Flux (μmol/s) per Luminaire

Add LED Calculate Clear

	Product	Color	Ratio (%)	Photon Flux (μmol/s)	Led Count	Brightness Bin	Binning Brightness	Forward Voltage (V)	Forward Current (mA)
	OSLON Square, GD CSSRH2.14	Deep Blue (439-461 nm)	10.00	100	21	AS (700 mA)	1470	2.9	700
	OSLON Square, GH CSSRH2.24	Hyper Red (635-666 nm)	90.00	900	196	VH (700 mA)	972.5	2.15	700

System Properties

Solder Point Temperature (°C)

Optical Efficiency (%)

Electrical Efficiency (%)

Luminaire Setup

☒ Auto Compute LED Gap

Luminaire length (mm)

Luminaire width (mm)

LED Gap (x-axis) (mm)

LED Gap (y-axis) (mm)

Greenhouse Setup

☒ Top Lighting ☐ Inter Lighting

Distance Luminaire - Plants (m)

Plant Area length (m)

Plant Area width (m)

Number of luminaires in a row

Number of luminaires in a column

Luminaire Gap (x-axis) (m)

Luminaire Gap (y-axis) (m)

System Graphics

System 3D

Distance of luminaire to PFD false color map (m)

Spectral Distribution

☒ LED Spectrum ☐ Bare Canister

☒ Chlorophyll A ☐ ZPP ☐ Phytyochrome P1

☒ Chlorophyll B ☐ PP ☐ Phytyochrome P2

Intensity 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0

Wavelength in nm 380 400 450 500 550 600 650 700 750

Save your Solution by pressing the Save button if you are logged on to the tool.

Open a saved Solution by pressing the Open button if you are logged on to the tool.

Save Solution

Solution Name *

Solution

Folder

Default

New

Save Cancel

Solutions

Search Solution

Last Edit

☐ - Default (4)

☐ Greenhouse Interlight Growth 2018/11/14

☐ MultiLayer Growth 2018/11/14

☐ Greenhouse Toplight Flowering 2018/11/14

☐ Greenhouse Toplight Growth 2018/11/14

☐ + Reference Scenarios (0)

Delete Rename Folder Change Folder

Thank you.