



lightSTUDIO

light box to illuminate a scene with different standardized light types

I INTRODUCTION

lightSTUDIO is a light box to illuminate a scene with different standardized light types.

The light sources F11, F12, D50, D65 and tungsten (3100K, 2100K, 2800K, 10000K) are possible. All light sources can be dimmed from 1-100% to set an appropriate light level. The box can be controlled via the control panel at the front of the box or by a USB connection to a Windows PC. A graphical user interface is provided for Windows, the software can also be used as command line version.



arranged lightSTUDIO



control panel of the lightSTUDIO

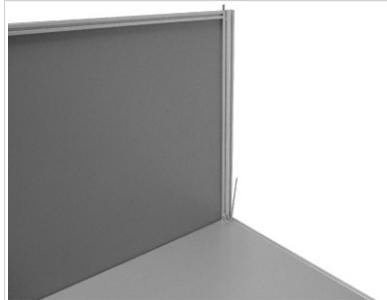
II SETUP

2.1 BOX ASSEMBLY

Remove the packaging material and place the bottom plate on the floor or on the table..



Set the left side wall to the left side of the bottom plate and fasten together with screws.



Do the same with a right side wall. With help of another person carefully position the upper section of the lightSTUDIO on the assembled bottom section so that the four pegs of the bottom section fit into the appropriate holes of the upper section.

After that fasten the bottom and upper section together with four screws.

Insert the background plate into the guiding grooves on the left side of the lightSTUDIO.



2.2 LAMPS INSTALLING



Unscrew the two screws which hold the white diffusion plate and pull it out.



Put four halogen bulbs into the sockets.



Set the diffusion plate back on its former position and fasten the screws. From the back side of the box detach the blue filter foil from the hooks.

Put nine halogen bulbs into the sockets and attach the blue filter foil back.



Insert the eight fluorescent lamps on the appropriate fitting according to labeling on the fittings and identification on the lamps.

2.3 SOFTWARE SETUP

Put the install-CD into the CD slot.

Connect the lightSTUDIO to PC via USB-cable and switch on the power switch. The Windows USB-driver setup will start automatically. Follow the setup directions. If for the search path will be asked, manually set the searching directory to search from the install-CD. If the Windows USB-driver setup did not start, open the Windows Control Panel, than open the Microsoft Device Management Console, find USB-device „lightSTUDIO“ and with right mouse click choose the button „driver update“. After USB-driver installing start the file „install_lightSTUDIO.exe“ from the install-CD and follow the directions.

III WORKING WITH THE lightSTUDIO

Important note:

Fluorescent tubes after switching on or dimming need some time to level off its irradians power. Therefore always wait at least 5 min after switching on or readjusting the light intensity.

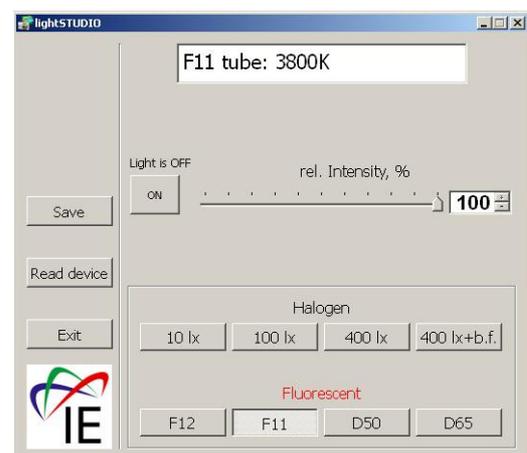
3.1 WORKING WITHOUT PC

After switching the power switch the LCD display will show „Select channel“. Choose desired light source by means of push buttons on the control panel. Than push the button „Light ON/OFF“ to switch the light on. To change the light intensity use the rotary knob „Intensity“. With an adjusting knob „LCD backlight“ you can adjust display panel backlighting to provide optimum viewing in diverse lighting conditions. If you often work with other than 100% light intensity you can store the desired value for each of the light sources F12, F11, D50, D65, Halogen 400 lx and 400 lx + b.f. as default. To do that set the desired light intensity with the rotary knob „Intensity“, than push the button of desired light source, hold it and push the button „Light ON/OFF“. The LCD display will show „Stored“.

3.2 WORKING WITH PC

Start the „lightSTUDIO.exe“. If the device is switched on and connected via USB-cable to PC you will see the similar message in the window of the GUI (Graphical User Interface) like on the picture below.

The layout of the GUI is built similarly to the control panel. The light intensity can be changed by moving the slider with the mouse or directly by keying the needed value in the window. By pushing the button “Save” you can store the desired value of light intensity for each of the light sources F12, F11, D50, D65, Halogen 400 lx and 400 lx + b.f. as default. The button “Read device” allows you to read and synchronize controls selected manually on the control panel if they were changed.





IV COMMAND LINE USING

You can use command line version to make your own SW application (for example automatic test).

Apply: lightSTUDIO_console.exe <command>

For example:

C:/Programme/ lightSTUDIO_console.exe ch1_on

after execution of this command the fluorescent lamp F12 will be switched on.

C:/Programme/ lightSTUDIO_console.exe duty 0540

after execution of this command the relative intensity will be changed to 54,0%

Commands for setting

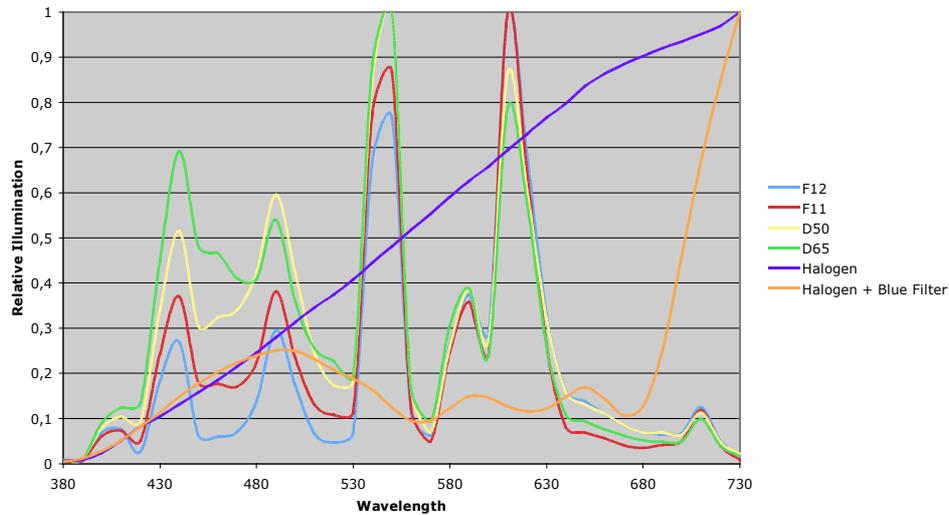
<command>	command description
ch1_on	select the light source F12
ch2_on	select the light source F11
ch3_on	select the light source D50
ch4_on	select the light source D65
ch5_on	select the light source Halogen bulb 10 lx
ch6_on	select the light source Halogen bulb 100 lx
ch7_on	select the light source Halogen bulb 400 lx
ch8_on	select the light source Halogen bulb 400 lx with blue filter
on	switch on the light source
off	switch off the light source
duty	set desired relative intensity. Use: duty 0010 to set 1,0% duty 1000 to set 100,0%. Any other values are possible between 0010 and 1000 with step of 10
store	save the currently selected relative intensity for light sources F12, F11, D50, D65, Halogen 400 lx and 400 lx + b.f. as default

Commands for reading the status of the lightSTUDIO

<command>	command description
OnOff?	returns „1“ if light is ON or „0“ if light is OFF
duty?	returns value of relative intensity. For example 0250 stands for 25,0%
chnr?	returns which channel is currently selected: „1“ for F12, „2“ for F11, „3“ for D50, „4“ for D65, „5“ for halogen 10 lx, „6“ for halogen 100 lx, „7“ for halogen 400 lx, „8“ for halogen 400 lx with blue filter

V TECHNICAL DATA

Relative Spectral Distribution of Lightsources



Illumination type	Color temperature, ca. [K]	max. light level [Lux]	
F12	2800	1600	dimmable
F11	3800	1600	dimmable
D50	5000	1600	dimmable
D65	6500	1600	dimmable
Halogen 10 lx	2100	10	dimmed
Halogen 100 lx	2800	100	dimmed
Halogen 400 lx	3100	400	dimmable
Halogen 400 lx with blue filter	10000	400	dimmable

supply voltage	220 – 240 V, 50/60 Hz
outer dimension [cm], w/h/d	130 / 80 / 80
inner dimension bottom plate [cm], w/d	125 / 75
the height of the area for a test scene [cm]	60
weight [kg]	ca. 45 kg
power consumption	max. 200 VA
USB interface	USB 1.1

Type of lamps

Illumination type	Type of lamp	quantity
Halogen bulb	NV Halogenlampe 20W 12V MEGA IRC, GU5,3, 60Gr RJLS20W 12 IRC VWFL GU5.3 Other types can be used if they satisfy the following requirements: 12V, 20W, socket GU5.3, emitting angle 60°, with safety glass and cool beam technology	13
F12	OSRAM L 36W/930, or other 36W with CRI (color rendering index) of >90 and color temperature of 2800-3000 K	2
F11	OSRAM L 36W/940, or other 36W with CRI of >90 and color temperature of 3800-4000 K	2
D50	OSRAM L 36W/950, or other 36W with CRI of >90 and color temperature of 5000 K	2
D65	OSRAM L 36W/965, or other 36W with CRI of >90 and color temperature of 6500 K	2

VI DETAILED DESCRIPTION OF THE OBJECTS



The text markers represent high saturated (neon) colors and show the camera's reproduction of these.



A set of 24 different colored felt-tip pens. They show the ability of the camera to differentiate the different colors.



The red, green, and blue colored balls of wool are used to visualize the cameras ability to reproduce low contrast fine detail in different colors.



The Teddy Bear serves the same purpose than the wool balls but with its brown color it is produced by a mixture of red green and blue and therefore better represents natural objects.



The wine bottle with the fine details on the label indicates the resolution of the camera. The sharpness and readability of the text is important especially the bright text on the red label. In the dark areas the shadow details can be evaluated.



The three ladies represent human skin tone colors and their reproduction by the camera.



If there is a standard color chart in the world it is the x-rite Color Checker. This chart is used everywhere to check the color fidelity of cameras.



Some cameras produce aliasing artifacts often also referred to as moiré. If a camera has that problem it typically is visible on a sieve like the one we put in that scene.



Wooden structure and colors can be checked by looking at the wood and cork plate.



Sharpness, resolution, and text readability can be determined from the newspaper. The cover page has been reprinted on paper with a much higher image permanence than the original paper.



The cup, plates, and silverware show the highlight detail content.



Many cameras have problems reproducing the purple color of the chocolate brand.



Sharpness and resolution as well as low contrast detail can be determined from the rope. A rope like the one in this scene consists of structures at different spatial frequencies.



Colored wood is another color indicator.



From the red roses in the green vase the details in high saturated color details as well as shadow details can be determined.



The artificial bananas, apples, peas etc. can be used as memory colors and should look like natural food.



The gray table cloth is reflecting near IR to a certain extend. If the camera is sensitive in the near IR - which is usually prevented by using an IR cut filter - the gray cloth will appear to be reddish.



Strong distortion as well as highlight details can be determined from the blue checked pattern.



The Background image – the Cologne sky line – ensures that the camera sees this scene not as a test chart but as a real scene. In addition the blue sky and the rest of the colors show what the camera does to natural scenes.



Shadow details can be determined from the black cloth.