



Overview

Product name	lightSTUDIO
Principle	A device with variable natural scene lighting for a reproducible visual assessment of image quality. lightSTUDIO is available in different setups to simulate multiple illuminants, moving content, and/or mixed light situations.

Features

lightSTUDIO

Inner dimension (space for the scene)	Width	Depth	Height
	lightSTUDIO-S	1250 mm	750 mm
lightSTUDIO-SM	1250 mm	750 mm	820 mm
lightSTUDIO-ST (2 x)	624 mm	750 mm	600 mm
lightSTUDIO-SMH	1250 mm	750 mm	820 mm
lightSTUDIO-L	1250 mm	750 mm	780 mm
lightSTUDIO-LM	1250 mm	750 mm	820 mm
lightSTUDIO-LMH	1250 mm	750 mm	820 mm
lightSTUDIO-LH	1250 mm	750 mm	780 mm

Specialties	<ul style="list-style-type: none"> Interior included Background chart with natural scene included
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Illumination / lightHEAD-S

Light sources	<p>lightSTUDIO-S versions:</p> <p>2 x F12 fluorescent tube OSRAM L 36 W/930 *</p> <p>2 x F11 fluorescent tube OSRAM L 36 W/940 *</p> <p>2 x D50 fluorescent tube OSRAM L 36 W/950 *</p> <p>2 x D65 fluorescent tube OSRAM L 36 W/965 *</p> <p>5 x halogen lamp 20 W. 12 V, infrared coated</p> <p>9 x halogen lamp 20 W. 12 V, infrared coated</p> <p>lightSTUDIO-ST versions:</p> <p>4 x F12 HQ fluorescent tube OSRAM L 18 W/930 *</p>
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	2 x F11 HQ fluorescent tube OSRAM L 18 W/940 * 2 x D50 HQ fluorescent tube OSRAM L 18 W/950 * 2 x D65 HQ fluorescent tube OSRAM L 18 W/965 * 6 x halogen lamp 20 W, 12 V, infrared coated 8 x halogen lamp 20 W, 12 V, infrared coated
Response time (illuminant switch)	Fluorescent lamps: stable color temperature after 3 minutes Halogen: < 1 s
Illumination levels	F12, F11, D50, D65: approx. 12 lx – 2200 lx Halogen: approx. 5 lx – 700 lx Halogen with blue filter: approx. 4 lx – 400 lx
Dim function	Dimmable from 0-100% in 1% steps
Predefined illuminants	F12, F11, D50, D65, fluorescent light source (100% intensity) Halogen: 10 lx, 100 lx, and 400 lx Halogen with blue filter: 400 lx
Service life	lightSTUDIO-S LLMF** F12, F11: 12,000 h: 0.85 4,000 h: 0.9 D50: 12,000 h: 0.68 4,000 h: 0.72 D65: 12,000 h: 0.9 4,000 h: 0.99 lightSTUDIO-ST LLMF**: F12, F11: 12,000 h: 0.91 4,000 h: 0.94 D50: 12,000 h: 0.79 4,000 h: 0.86 D65: 12,000 h: 0.85 4,000 h: 0.9 Halogen: 4,000 h

Illumination / lightHEAD-L

Light source	10 x iQ-LED V2 Image Engineering iQ-LED V2 technology: <ul style="list-style-type: none"> - 41 SMD high-power LEDs - Split into 20 color channels - Spectral range: 380 – 820 nm - Intensity adjustable in 4000 steps per channel with 32 kHz PWM (switchable to 1000 steps with 128 kHz) - An approx. lifetime of 10,000 hours - Typical LED spectra on request
Control functionality without PC	Storage of up to 44 different illuminants and one sequence on the device Default illuminant available Controllable with micro switches on the device panel
Illumination stability	+/-1% when stabilized (2% after switching D illuminants in the first 5 seconds)
Response time (illuminant switch)	< 50 ms
Maximum/Minimum illumination level	Up to 2000 lx for standard D illuminants Minimum down to 25 lx for standard D illuminants
Dim function	Software: set the intensity during the creation of the illuminant with a dedicated illuminant type Device: selection of different illuminants stored on the device with a control panel
Predefined standard spectra **	D50, D55, D65, D75, A, B, C, E Create a Planckian spectral curve utilizing a selected temperature (1900 - 18,000 K)
Service life	10,000 h (iQ-LED V2)



Light source	<p>5 x iQ-LED V2</p> <p>Image Engineering iQ-LED V2 technology:</p> <ul style="list-style-type: none"> - 41 SMD high-power LEDs - Split into 20 color channels - Spectral range: 380 – 820 nm - Intensity adjustable in 4000 steps per channel with 32 kHz PWM (switchable to 1000 steps with 128 kHz) - Typical LED spectra on request <p>10x iQ-LED-IR</p> <p>Image Engineering iQ-LED IR technology:</p> <ul style="list-style-type: none"> - 11 additional THT LED channels - Spectral range: 380, 820 – 1050 nm - Intensity adjustable in 1000 steps per channel with 32 kHz PWM - Typical LED spectra on request <p>Combined spectral range (iQ-LED V2 and iQ-LED-IR): 380 – 1050 nm</p>
Control functionality without PC	Storage of up to 44 different illuminants and one sequence on the device
Illumination stability	<p>iQ-LED V2: +/- 1% when stabilized (2% after switching D illuminants in the first 5 seconds)</p> <p>iQ-LED IR: +/- 2% when stabilized</p>
Response time (illuminant switch)	< 50 ms
Maximum / Minimum illumination level	<p>Up to 1000 lux for standard D illuminants</p> <p>Minimum down to 25 lux for standard D illuminants</p>
Dim function	Software-based by presetting the intensity or by selecting different pre-stored intensity illuminants directly on the device
Predefined standard spectra **	<p>D50, D55, D65, D75, A, B, C, E</p> <p>Planckian spectral curve by selected temperature (1900 – 18,000 K)</p>
Service life	10,000 h



Light source	<p>10 x iQ-LED V2</p> <p>Image Engineering iQ-LED V2 technology:</p> <ul style="list-style-type: none"> - 41 SMD high-power LEDs - Split into 20 color channels - Spectral range: 380 – 820 nm - Intensity adjustable in 4000 steps per channel with 32 kHz PWM (switchable to 1000 steps with 128 kHz) - An approx. lifetime of 10.000 hours - Typical LED spectra on request <p>5 x iQ-LED 850 and 5 x iQ-LED 940</p> <p>Image Engineering iQ-LED 850 and iQ-LED 940 technology:</p> <ul style="list-style-type: none"> - 4 SMD high-power LEDs - Intensity adjustable in 4000 steps per channel with 32 kHz PWM (switchable to 1000 steps with 128 kHz) - An approx. lifetime of 10.000 hours - Typical LED spectra on request
Control functionality without PC	<p>Storage of up to 44 different illuminants and one sequence on the device</p> <p>Default illuminant available</p> <p>Controllable with micro switches on the device panel</p>
Illumination stability	<p>+/- 1% when stabilized (2% after switching D illuminants in the first 5 seconds)</p>
Response time (illuminant switch)	<p>< 50 ms</p>
Maximum / Minimum illumination level	<p>Up to 2000 lux for standard D illuminants</p> <p>Minimum down to 25 lux for standard D illuminants</p>
Dim function	<p>Software: set the intensity during the creation of the illuminant with a dedicated illuminant type</p> <p>Device: a selection of different illuminants are stored on the device with a control panel</p>
Predefined standard spectra **	<p>D50, D55, D65, D75, A, B, C, E</p> <p>Create a Planckian spectral curve by selected temperature (1900 – 18,000 K)</p>
Service life	<p>10,000 h (iQ-LED V2)</p>



Spectrometer (only lightSTUDIO-L versions)

Construction	Built-in spectrometer
Spectral range	305 – 1100 nm
Resolution	2048 pixels
FWHM	2.5 nm
Spectra visualization	Real-time measurement of spectral distribution and radiant power in lightSTUDIO software
Calibration	Yearly calibration required independent of working hours (contact Image Engineering), NIST traceable

Illumination / HDR box (lightSTUDIO-H versions)

Light source*	2 x LG4 with 432 LEDs each
Output window	Rectangular output window, 290 x 220 mm Dual slot for D280-sized test charts
CRI	> 95 Ra
Color Temperature	approx. 5000 K +/-5%
Uniformity	> 95 % for active chart area, 280 x 157.5 mm > 85% at < 1% of max. intensity
Illumination stability	+/-5% (after warm-up)
Warm-up time	Up to 10 min (depending on illumination level and ambient temperature)
Guaranteed illumination range	approx. 10 - 65000 lx ***** <ul style="list-style-type: none"> • Normal mode: 0 – 100% / 32 kHz / 100 to 65000 lx ***** • Low mode: 0 – 100% / 32 kHz / 10 to 6500 lx *****

Moving-Option (only lightSTUDIO-M versions)

Translation	0.001 – 3 m/s (left to right and right to left)
Rotation speed	0.5 – 360 rpm (bidirectional)
Test charts	TE276 Dead Leaves (translation) Black/white sector plate (rotation)

iQ-Timecode (only lightSTUDIO-M versions)

Display range	Timecode mode: 00:00:000 – 99:59:999 [m:s:ms] Counter mode: 0 - 65535 counts
Dimension [W x H x D]	223 x 103 x 30 mm
Weight	Approx. 0.5 kg

iQ-Trigger + iQ-Trigger-T (optional, included in lightSTUDIO-M versions)

Please refer to the iQ-Trigger and iQ-Trigger -T datasheets.



Software

System requirements	PC with Windows 7 operating system (or higher) 1 USB port free
lightSTUDIO	<ul style="list-style-type: none"> Control of translational and rotational test chart (speed, direction, duration) Control of iQ-Trigger Control of lightHEAD-L (generation of illuminants based on predefined or imported spectral data, creation of sequences, real-time spectral measurement) Control of lightHEAD-S (switch lamps on/off, dim function) Control of HDR box Control of iQ-Timecode Display (start, stop, set time) Creation of batch processing lists for all components
API (C++)	Available as separate options: iQ-LED API, iQ-Standardlight API, iQ-Drive API, iQ-Timecode API, LG API
CLI	A command line interface (CLI) is delivered with the Standard lightHEAD
iQ-Standardlight	Simplified control software is delivered with the lightSTUDIO-ST

General description hardware

Power supply/frequency/consumption		Power supply	Frequency	Max. power consumption
	lightSTUDIO-S	220 - 240 V	50/60 Hz	200 W
	lightSTUDIO-SM	220 - 240 V	50/60 Hz	800 W
	lightSTUDIO-SMH	220 - 240 V	50/60 Hz	1300 W
	lightSTUDIO-ST	220 - 240 V	50/60 Hz	200 W
	lightSTUDIO-L	100 - 240 V	50/60 Hz	800 W
	lightSTUDIO-LM	100 - 240 V	50/60 Hz	1400 W
	lightSTUDIO-LH	100 - 240 V	50/60 Hz	1300 W
lightSTUDIO-LMH	100 - 240 V	50/60 Hz	1900 W	
Connectors	1 x USB 1.1 (PC connection) 1 x power adaptor			
Outer dimension		Width	Depth	Height
	lightSTUDIO-S	1300 mm	800 mm	800 mm
	lightSTUDIO-SM	2320 mm	820 mm	1920 mm
	lightSTUDIO-SMH	2320 mm	1290 mm	1920 mm
	lightSTUDIO-ST	1300 mm	800 mm	800 mm
	lightSTUDIO-L	1300 mm	800 mm	1120 mm
	lightSTUDIO-LM	2320 mm	820mm	1980 mm
	lightSTUDIO-LH	1300 mm	1270 mm	1120 mm
lightSTUDIO-LMH	2320 mm	1290 mm	1980 mm	
Weight	lightSTUDIO-S	approx. 40 kg		
	lightSTUDIO-SM	approx. 134 kg		
	lightSTUDIO-SMH	approx. 162 kg		
	lightSTUDIO-ST	approx. 45 kg		
	lightSTUDIO-L	approx. 61 kg		
	lightSTUDIO-LM	approx. 150 kg		
	lightSTUDIO-LH	approx. 89 kg		
lightSTUDIO-LMH	approx. 178 kg			



Operating conditions	lightHEAD-L: 18 - 28 degrees Celsius, optimal: 22 - 26 °C all lightSTUDIOS: average room temperature and humidity, do not cover vents													
Warm-up time	< 2 min. at optimal ambient temperature (iQ-LED lightHEAD) Approx. 3 min. (fluorescent light sources)													
Rolling Cart	<ul style="list-style-type: none"> Included in lightSTUDIO-H and lightSTUDIO-M versions Optional for all other versions Wheels with brakes 													
Scope of delivery (hardware)		lightHEAD-S / -ST / -L	Background Chart	HDR box	Interior	Moving option	power cord	USB cable	iQ-Trigger Adapter-Box I	control software	calibration protocol	iQ-Trigger + iQ-Trigger-T	iQ-Mobilemount	
	lightSTUDIO-S	S	x		x		x	x		x	x			
	lightSTUDIO-SM	S	x		x	x	x	x	x	x	x	x	x	
	lightSTUDIO-SMH	S	x	x	x	x	x	x	x	x	x	x	x	
	lightSTUDIO-ST	S T	x		x		x	x		x	x			
	lightSTUDIO-L	L	x		x		x	x		x	x			
	lightSTUDIO-LM	L	x		x	x	x	x	x	x	x	x	x	
	lightSTUDIO-LH	L	x	x	x		x	x		x	x			
	lightSTUDIO-LMH	L	x	x	x	x	x	x	x	x	x	x	x	
Scope of delivery (software)		lightSTUDIO	iQ-StandardLight	lightSTUDIO CLI	iQ-LED									
	lightSTUDIO-S	x		x										
	lightSTUDIO-SM	x		x										
	lightSTUDIO-SMH	x		x										
	lightSTUDIO-ST		x	x										
	lightSTUDIO-L	x			x									
	lightSTUDIO-LM	x			x									
	lightSTUDIO-LH	x												
	lightSTUDIO-LMH	x			x									

Miscellaneous

Accessories	Rolling Cart, Replacement Kits (lightSTUDIO Interior, lightSTUDIO Background Chart, lightSTUDIO-S light bulbs, lightSTUDIO-ST light bulbs), iQ-LED software
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* Light sources are delivered ready to use, burn-in period of 100 h

** LLMF: Lamp Lumen Maintenance Factor. LLMF is the ratio of the luminous flux emitted by the lamp at a given time in its life to the initial (100 hours burn-in time) luminous flux.

*** iQ-LED light source