

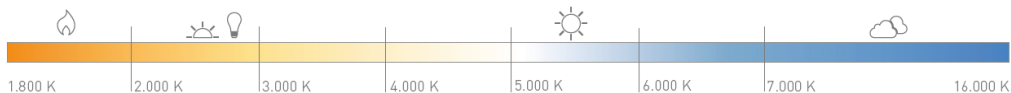


3 light options:
HIGH: 2-4 LED modules
STANDARD: 2-8 LED modules
ECO: 2-16 LED modules



constant luminous flux from 2,500 K up to 16,000 K
 high thermal stability
 high efficiencies and maximum light uniformity

PI-LED LINEAR SYSTEM HD



Tunable white
 1.800K - 16.000K



Brightness dimmable
 1% - 100%



RGB/CIE-xy adjustable
 Colour points and sequences



Biorhythmic lighting
 Vitalisation and recreation



2 Control modes
 DALI DT8, ZigBee 3.0



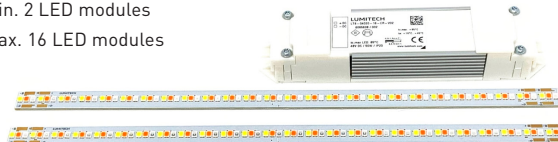
Excellent CRI
 CRI > 90



TECHNICAL DATA

	HIGH	STANDARD	ECO
	max. 4 LED modules	max. 8 LED modules	max. 16 LED modules
Luminous source	SMD LED module with HighDensity placement		
Supply voltage	48V DC		
Typ. power per LED module	15 W	8 W	2.9 W
Luminous flux per LED module	1,800 lm	1,000 lm	400 lm
Efficiency per PI-LED system	120 lm / W	125 lm / W	138 lm / W
Control mode	ZigBee 3.0, DALI DT8		
Dimmable	1% - 100% Modular Dimming* / Camera-Ready*		
CCT and colour control	1,800 - 16,000K / adjustable CIE-xy-colours and RGB colours		
Ambient / storage temperature	+10°C ... +45°C / -20°C ... +80°C		
t _{c, max} LED module / t _{c, max} LMU	+75°C / +65°C		
Lifetime	50,000h L80B10		
Additional features	Low tolerance for colour temperature (max. MacAdam 2)		

min. 2 LED modules
 max. 16 LED modules



*According to IEEE 1789-2015
 (valid for all dimming levels,
 CCT and colour settings)

LINEAR SYSTEM HD

■ ORDERING DATA AND TECHNICAL DATA – LINEAR HD

Type	Description	Control mode	Cable [mm]	[lm]	Voltage [V DC]	Power typ. max. [W]	Num. of modules
HIGH - 1,800lm per LED module				at 55°C		at 55°C	
LTS-03620-15-HLS	PI-LED Linear High 3600LM / 2x280mm / 30W / DALI DT8 / 700mm	DALI DT8	700	3,600	48	30 36	2
LTS-03620-16-HLS	PI-LED Linear High 3600LM / 2x280mm / 30W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	3,600	48	30 36	2
LTS-05420-15-HLS	PI-LED Linear High 5400LM / 3x280mm / 45W / DALI DT8 / 700mm	DALI DT8	700	5,400	48	45 54	3
LTS-05420-16-HLS	PI-LED Linear High 5400LM / 3x280mm / 45W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	5,400	48	45 54	3
LTS-07220-15-HLS	PI-LED Linear High 7200LM / 4x280mm / 60W / DALI DT8 / 700mm	DALI DT8	700	7,200	48	60 72	4
LTS-07220-16-HLS	PI-LED Linear High 7200LM / 4x280mm / 60W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	7,200	48	60 72	4
STANDARD - 1,000lm per LED module				at 50°C		at 50°C	
LTS-02020-15-SLS	PI-LED Linear Standard 2000LM / 2x280mm / 16W / DALI DT8 / 700mm	DALI DT8	700	2,000	48	16 20	2
LTS-02020-16-SLS	PI-LED Linear Standard 2000LM / 2x280mm / 16W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	2,000	48	16 20	2
LTS-03020-15-SLS	PI-LED Linear Standard 3000LM / 3x280mm / 24W / DALI DT8 / 700mm	DALI DT8	700	3,000	48	24 30	3
LTS-03020-16-SLS	PI-LED Linear Standard 3000LM / 3x280mm / 24W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	3,000	48	24 30	3
LTS-04020-15-SLS	PI-LED Linear Standard 4000LM / 4x280mm / 32W / DALI DT8 / 700mm	DALI DT8	700	4,000	48	32 40	4
LTS-04020-16-SLS	PI-LED Linear Standard 4000LM / 4x280mm / 32W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	4,000	48	32 40	4
LTS-05020-15-SLS	PI-LED Linear Standard 5000LM / 5x280mm / 40W / DALI DT8 / 700mm	DALI DT8	700	5,000	48	40 50	5
LTS-05020-16-SLS	PI-LED Linear Standard 5000LM / 5x280mm / 40W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	5,000	48	40 50	5
LTS-06020-15-SLS	PI-LED Linear Standard 6000LM / 6x280mm / 48W / DALI DT8 / 700mm	DALI DT8	700	6,000	48	48 60	6
LTS-06020-16-SLS	PI-LED Linear Standard 6000LM / 6x280mm / 48W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	6,000	48	48 60	6
LTS-07020-15-SLS	PI-LED Linear Standard 7000LM / 7x280mm / 56W / DALI DT8 / 700mm	DALI DT8	700	7,000	48	56 70	7
LTS-07020-16-SLS	PI-LED Linear Standard 7000LM / 7x280mm / 56W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	7,000	48	56 70	7
LTS-08020-15-SLS	PI-LED Linear Standard 8000LM / 8x280mm / 64W / DALI DT8 / 700mm	DALI DT8	700	8,000	48	64 80	8
LTS-08020-16-SLS	PI-LED Linear Standard 8000LM / 8x280mm / 64W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	8,000	48	64 80	8
ECO - 400lm per LED module				at 45°C		at 35°C	
LTS-00820-15-ELS	PI-LED Linear Eco 800LM / 2x280mm / 5,8W / DALI DT8 / 700mm	DALI DT8	700	800	48	5.8 7.2	2
LTS-00820-16-ELS	PI-LED Linear Eco 800LM / 2x280mm / 5,8W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	800	48	5.8 7.2	2
LTS-01220-15-ELS	PI-LED Linear Eco 1200LM / 3x280mm / 8,7W / DALI DT8 / 700mm	DALI DT8	700	1,200	48	8.7 10.8	3
LTS-01220-16-ELS	PI-LED Linear Eco 1200LM / 3x280mm / 8,7W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	1,200	48	8.7 10.8	3
LTS-01620-15-ELS	PI-LED Linear Eco 1600LM / 4x280mm / 11,6W / DALI DT8 / 700mm	DALI DT8	700	1,600	48	11.6 14.4	4
LTS-01620-16-ELS	PI-LED Linear Eco 1600LM / 4x280mm / 11,6W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	1,600	48	11.6 14.4	4
LTS-02020-15-ELS	PI-LED Linear Eco 2000LM / 5x280mm / 14,5W / DALI DT8 / 700mm	DALI DT8	700	2,000	48	14.5 18	5
LTS-02020-16-ELS	PI-LED Linear Eco 2000LM / 5x280mm / 14,5W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	2,000	48	14.5 18	5
LTS-02420-15-ELS	PI-LED Linear Eco 2400LM / 6x280mm / 17,4W / DALI DT8 / 700mm	DALI DT8	700	2,400	48	17.4 21.6	6
LTS-02420-16-ELS	PI-LED Linear Eco 2400LM / 6x280mm / 17,4W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	2,400	48	17.4 21.6	6
LTS-02820-15-ELS	PI-LED Linear Eco 2800LM / 7x280mm / 20,3W / DALI DT8 / 700mm	DALI DT8	700	2,800	48	20.3 25.2	7
LTS-02820-16-ELS	PI-LED Linear Eco 2800LM / 7x280mm / 20,3W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	2,800	48	20.3 25.2	7
LTS-03220-15-ELS	PI-LED Linear Eco 3200LM / 8x280mm / 23,2W / DALI DT8 / 700mm	DALI DT8	700	3,200	48	23.2 28.8	8
LTS-03220-16-ELS	PI-LED Linear Eco 3200LM / 8x280mm / 23,2W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	3,200	48	23.2 28.8	8
LTS-03620-15-ELS	PI-LED Linear Eco 3600LM / 9x280mm / 26,1W / DALI DT8 / 700mm	DALI DT8	700	3,600	48	26.1 32.4	9
LTS-03620-16-ELS	PI-LED Linear Eco 3600LM / 9x280mm / 26,1W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	3,600	48	26.1 32.4	9
LTS-04020-15-ELS	PI-LED Linear Eco 4000LM / 10x280mm / 29W / DALI DT8 / 700mm	DALI DT8	700	4,000	48	29 36	10
LTS-04020-16-ELS	PI-LED Linear Eco 4000LM / 10x280mm / 29W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	4,000	48	29 36	10
LTS-04420-15-ELS	PI-LED Linear Eco 4400LM / 11x280mm / 31,9W / DALI DT8 / 700mm	DALI DT8	700	4,400	48	31.9 39.6	11
LTS-04420-16-ELS	PI-LED Linear Eco 4400LM / 11x280mm / 31,9W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	4,400	48	31.9 39.6	11
LTS-04820-15-ELS	PI-LED Linear Eco 4800LM / 12x280mm / 34,8W / DALI DT8 / 700mm	DALI DT8	700	4,800	48	34.8 43.2	12
LTS-04820-16-ELS	PI-LED Linear Eco 4800LM / 12x280mm / 34,8W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	4,800	48	34.8 43.2	12
LTS-05220-15-ELS	PI-LED Linear Eco 5200LM / 13x280mm / 37,7W / DALI DT8 / 700mm	DALI DT8	700	5,200	48	37.7 46.8	13
LTS-05220-16-ELS	PI-LED Linear Eco 5200LM / 13x280mm / 37,7W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	5,200	48	37.7 46.8	13
LTS-05620-15-ELS	PI-LED Linear Eco 5600LM / 14x280mm / 40,6W / DALI DT8 / 700mm	DALI DT8	700	5,600	48	40.6 50.4	14
LTS-05620-16-ELS	PI-LED Linear Eco 5600LM / 14x280mm / 40,6W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	5,600	48	40.6 50.4	14
LTS-06020-15-ELS	PI-LED Linear Eco 6000LM / 15x280mm / 43,5W / DALI DT8 / 700mm	DALI DT8	700	6,000	48	43.5 54	15
LTS-06020-16-ELS	PI-LED Linear Eco 6000LM / 15x280mm / 43,5W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	6,000	48	43.5 54	15
LTS-06420-15-ELS	PI-LED Linear Eco 6400LM / 16x280mm / 46,4W / DALI DT8 / 700mm	DALI DT8	700	6,400	48	46.4 57.6	16
LTS-06420-16-ELS	PI-LED Linear Eco 6400LM / 16x280mm / 46,4W / ZigBee 3.0 / 700mm	ZigBee 3.0	700	6,400	48	46.4 57.6	16

Notes:

- All values apply at ta=25°C, 100% brightness and at 3,000K | illumination specifications in accordance with CIE1931
- Tolerance ranges: illumination data +/-15% | electrical data +/-15% | supply voltage 48V DC +/- 5%
- If the supply voltage exceeds the max. permitted operating voltage, the PI-LED system will be overstressed. This will result in a highly reduced service life.
- If the maximum temperature limits are exceeded, the lifetime of the PI-LED system will be greatly reduced or the system may be damaged. Temperature measurements of the LED module or PI-LED system have to be taken in the thermally stable state by means of a temperature sensor as per EN60598-1.
- The maximum system power of the PI-LED LINEAR SYSTEM HD is limited to the corresponding values above in column "Power typ. | max. [W]" due to its software.
- According to colour temperature and temperature of the PI-LED system, the Mac Adam tolerance takes on values < 4.
- All diagrams shown in this document show typical curves and not the exact behaviour of single LED modules.

LINEAR SYSTEM HD

III TECHNICAL DRAWINGS AND DATA

Dimension/Features of the LED modules

L/W [mm]	Light spots P / B / PCR*	Assembly of light spots
280 x 12	26 / 26 / 26	Linear, HD placement

Each PI-LED Linear System HD must be operated only after complete configuration and cabling.

The PI-LED Linear System HD must not be operated with less or more LED modules than provided for the system. Operation with a wrong number of LED modules can lead to destruction of the LED modules!

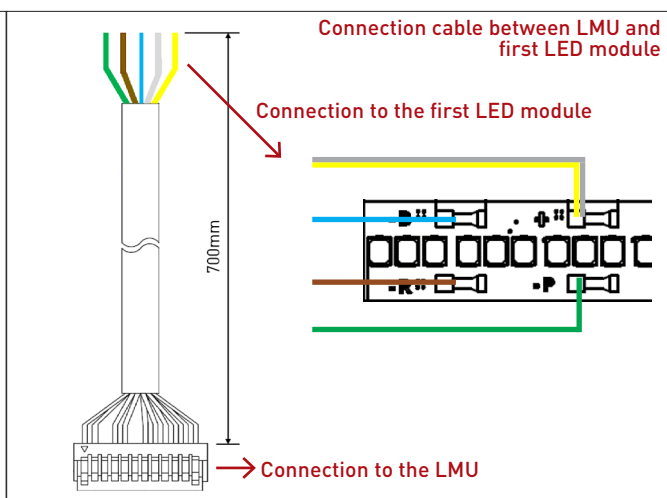
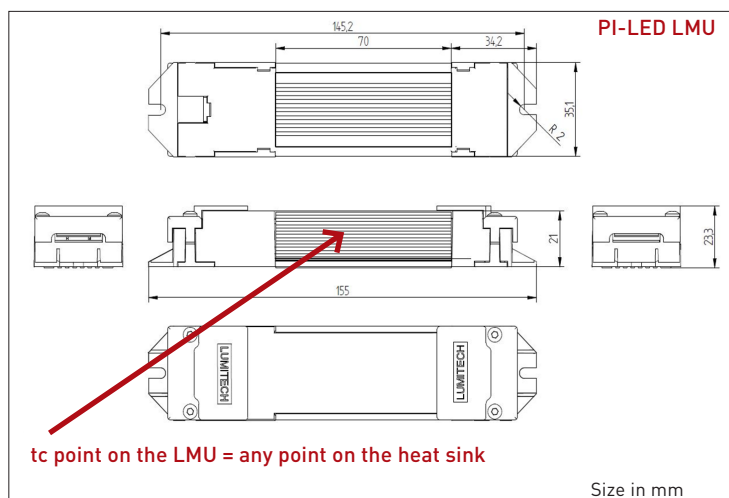
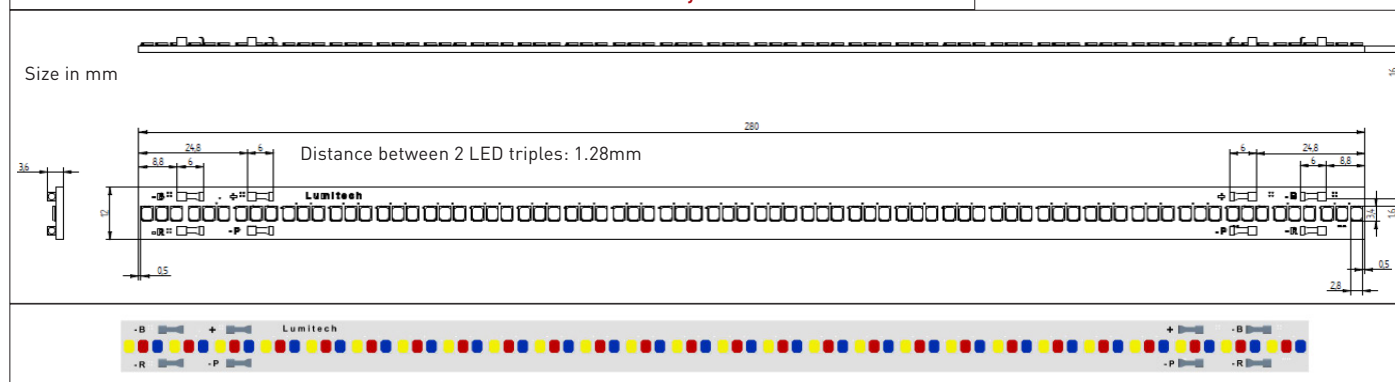
*Each light spot represents a LED triple consisting of 3 LED chips on which the PI-LED technology is based on: P = Phosphor / B = Blue / PCR = Phosphor Converted Red

The sequence of the LED modules is defined by **numbered labels**.
The PI-LED Linear System HD is delivered in a not prewired state.



symbolic image

LED module Master: connection between first LED module and LMU by 700mm connection cable

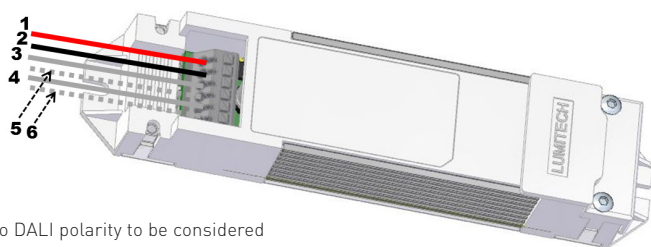


III CONFIGURATION OF THE PI-LED LINEAR SYSTEM HD / THE MOST IMPORTANT NOTES AT A GLANCE

Connection of the LED modules	Modules are delivered with plug terminals (4 connection wires from module to module). Consider markings on the LED modules - connect equal markings! Alternatively, due to the mechanical construction of the luminaire or possible shadowing effects caused by the plug terminals, the plug terminals can be desoldered and the LED modules can be then soldered.
Wire diameters to be used: AWG24	
Mounting the LED modules	no screwing: on the backside of the LED modules, a thermal conductive adhesive tape is attached.
Connection of the PI-LED LMU	The PI-LED LMU is connected to the first LED module with a 700mm connection cable (part of delivery). There is a clear assignment between PI-LED LMU and LED modules which is specified by a corresponding numbering on the labels of all parts of the PI-LED system. If the configuration of a PI-LED Linear System HD is done without considering this clear assignment, the calibration data stored in the PI-LED LMU are not correct. This can lead to colour differences between the LED modules of this PI-LED Linear System HD and/or between different PI-LED Linear Systems HD.

LINEAR SYSTEM HD

III CONNECTION - DALI DT8



No DALI polarity to be considered

Terminal connection

Terminal No.	Function
1	+ 48V DC
2	- 0V DC
3	DALI IN
4	DALI IN
5	DALI OUT
6	DALI OUT

*PI-LED systems with DALI interface are DALI1 / DALI Device Type 8 registered where colour control with regard to DALI Device Type 8 is fully implemented according to the underlying DALI standard. Since there is currently no possibility for testing products for compliance with the DALI Device Type 8 standard (no official DALI tester existing or available), a formal verification can not be provided.

"The DALI colour control functionality (part 209/Device Type 8) of this product has not been verified."

III FUNCTIONAL DESCRIPTION - DALI DT8*

Mode	CCT	RGB	CIE
Colour	1,800K-16,000K	Channels separately controllable	PI-LED colour space
Brightness	1% - 100%		

Information:

Colour accuracy in the colour mode is given only for CIE-xy points.

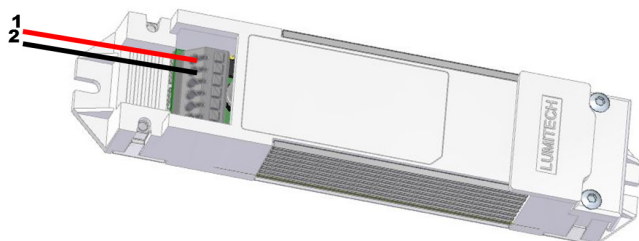
Possible assignment to a maximum of 16 groups and 16 light scenes

Recommended control units:

- LTP-1028 (DALI Touchpanel DT8)
- LTP-1029 (DALI Display 7" DT8)
- K-WDALI-USB (DALI USB Stick), together with the PC-App myPI-LED
- K-DALI-CDC (DALI control for daylight curves)
- K-DALI-SEQ (DALI control for colour sequences)
- LTP-DARA0x (DARA L Device in various versions, x = 1-6)

A complete list of compatible DALI DT8 control devices is available on request.

III CONNECTION - ZIGBEE 3.0



Terminal connection

Terminal No.	Function
1	+ 48V DC
2	- 0V DC

III FUNCTIONAL DESCRIPTION - ZIGBEE 3.0

Mode	CCT	RGB	CIE
Colour	1,800K-16,000K	Channels separately controllable	PI-LED colour space
Brightness	1% - 100%		

Possible assignment to groups and light scenes depending on control unit

Possible control units:

- LTP-1026 (NeoLink Box) together with the myPI-LED App for Android/iOS
- K-ZWALLY-1.2/2.2/3.2/4.2/5.2
- K-Z1001014 (ZigBee USB Stick), together with the PC-App myPI-LED

A complete list of compatible ZigBee 3.0 control devices is available on request.

Information:

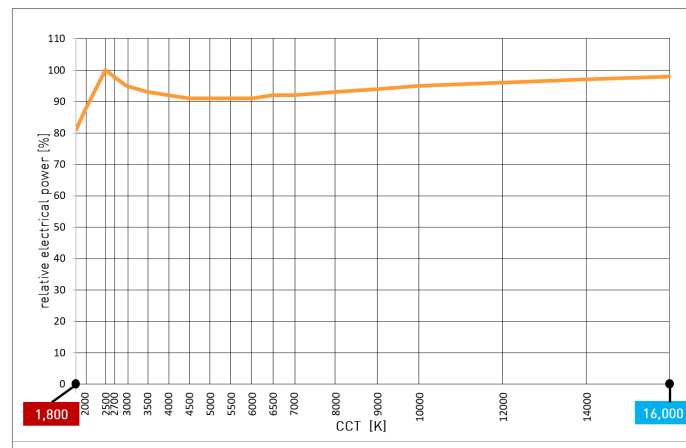
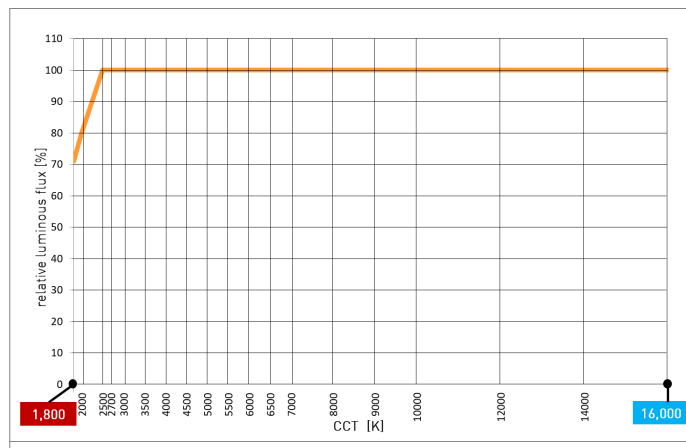
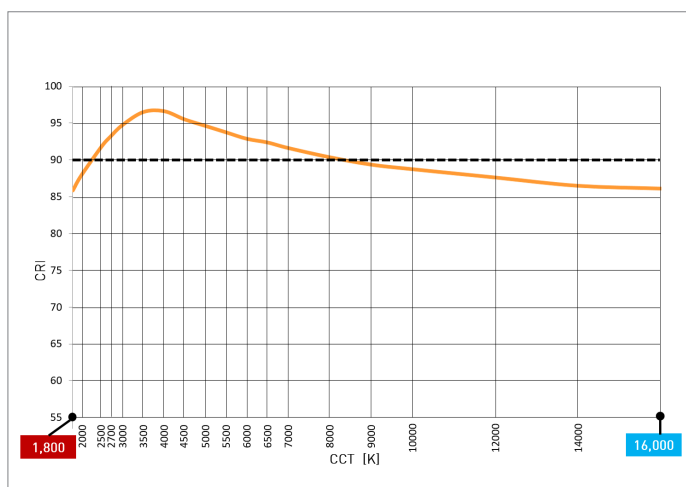
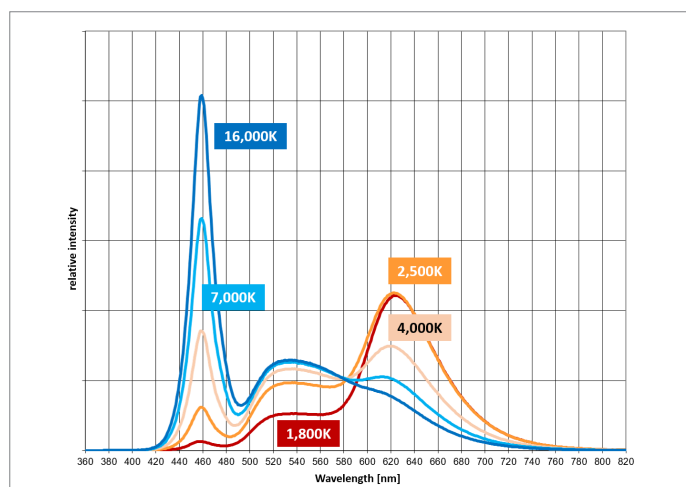
Depending on the assembly situation of the LMU, the range of the ZigBee module can vary.
Mounting the LMU inside of a sealed metal case can dramatically reduce the ZigBee range!

III NOTES ON STANDARDS AND SECURITY POLICIES

EOS/ESD security police	The PI-LED LINEAR SYSTEM HD contains components that are sensitive to electrostatic discharge. It may only be installed if appropriate EOS/ESD protection in manufacturing and in application is applied.	
CE - marking of the luminaire	The PI-LED LINEAR SYSTEM HD is tested according to the applicable standards (see Standards). Corresponding standard tests of the final product must be carried out separately.	
Fulfilled standards	EN62031 EN62471 EN61347-2-13 ETSI EN 300 328 V2.1.1 EN 301 489-3	LED modules for general lighting - Safety specifications Photobiological safety of lamps and lamp systems Particular requirements for d.c. or a.c. supplied electronic control gear for LED modules Wideband transmission systems - Data transmission equipment operating in the 2,4 GHz ISM band Electromagnetic compatibility and Radio spectrum Matters (ERM)

LINEAR SYSTEM HD

PHOTOMETRIC PROPERTIES / VISUAL DATA AND DATA FOR MELANOPIC LIGHT DESIGN



CCT [K]	general data				visual data (exemplary for a PI-LED SYSTEM with 4 LED modules)		melanopic values (relevant for melanopic light design)			
	CRI	Ra9	CIE-x	CIE-y	HIGH lum. flux [lm]	HIGH eff. [lm/W]	alpha [smel]	alpha [smel] x correction factor 1.103	Luminous flux [smel, d65] in %	Efficiency [smel, d65] in lm/W
1,800	85.9	62.9	0.5492	0.4082	5,110 / 71%	101	0.232	0.256	18	26
2,000	87.9	71.2	0.5268	0.4133	5,760 / 80%	105	0.272	0.300	24	32
2,500	91.9	91.4	0.4770	0.4137	7,200 / 100%	114	0.360	0.397	40	45
2,700	93.1	94.0	0.4599	0.4106	7,200 / 100%	117	0.393	0.433	43	51
3,000	94.8	94.3	0.4369	0.4041	7,200 / 100%	120	0.438	0.483	48	58
3,500	96.5	94.3	0.4053	0.3907	7,200 / 100%	123	0.507	0.559	56	69
4,000	96.6	94.1	0.3804	0.3767	7,200 / 100%	125	0.569	0.628	63	78
4,500	95.5	93.5	0.3608	0.3635	7,200 / 100%	126	0.623	0.687	69	86
5,000	94.6	92.8	0.3451	0.3516	7,200 / 100%	126	0.671	0.740	74	93
5,500	93.8	91.2	0.3324	0.3410	7,200 / 100%	126	0.714	0.788	79	99
6,000	92.9	89.6	0.3221	0.3318	7,200 / 100%	125	0.752	0.829	83	104
6,500	92.4	88.0	0.3135	0.3236	7,200 / 100%	125	0.787	0.868	87	108
7,000	91.6	86.9	0.3064	0.3165	7,200 / 100%	124	0.817	0.901	90	112
8,000	90.4	86.4	0.2952	0.3048	7,200 / 100%	123	0.869	0.959	96	118
9,000	89.4	86.4	0.2869	0.2956	7,200 / 100%	121	0.911	1.005	100	122
10,000	88.8	85.9	0.2806	0.2883	7,200 / 100%	120	0.946	1.043	104	126
12,000	87.6	81.1	0.2718	0.2776	7,200 / 100%	119	1.000	1.103	110	131
14,000	86.5	80.8	0.2659	0.2702	7,200 / 100%	117	1.038	1.145	114	134
16,000	86.1	80.6	0.2618	0.2648	7,200 / 100%	116	1.068	1.178	118	137

Light output category "HIGH"
Data at T_c = 55°

LINEAR SYSTEM HD

■ PHOTOMETRICAL PROPERTIES / VISUAL DATA AND DATA FOR MELANOPIC LIGHT DESIGN

CCT [K]	general data				visual data (exemplary for a PI-LED SYSTEM with 4 LED modules)		melanopic values (relevant for melanopic light design)			
	CRI	Ra9	CIE-x	CIE-y	STANDARD lum. flux [lm]	STANDARD eff. [lm/W]	alpha [smel]	alpha [smel] x correction factor 1.103	Luminous flux [smel, d65] in %	Efficiency [smel, d65] in lm/W
1,800	85.9	62.9	0.5492	0.4082	2,840 / 71%	105	0.246	0.271	19	28
2,000	87.9	71.2	0.5268	0.4133	3,200 / 80%	110	0.287	0.317	25	35
2,500	91.9	91.4	0.4770	0.4137	4,000 / 100%	119	0.381	0.420	42	50
2,700	93.1	94.0	0.4599	0.4106	4,000 / 100%	122	0.416	0.459	46	56
3,000	94.8	94.3	0.4369	0.4041	4,000 / 100%	125	0.466	0.514	51	64
3,500	96.5	94.3	0.4053	0.3907	4,000 / 100%	128	0.543	0.599	60	77
4,000	96.6	94.1	0.3804	0.3767	4,000 / 100%	130	0.612	0.675	68	88
4,500	95.5	93.5	0.3608	0.3635	4,000 / 100%	131	0.673	0.742	74	97
5,000	94.6	92.8	0.3451	0.3516	4,000 / 100%	131	0.727	0.802	80	105
5,500	93.8	91.2	0.3324	0.3410	4,000 / 100%	131	0.776	0.856	86	112
6,000	92.9	89.6	0.3221	0.3318	4,000 / 100%	130	0.820	0.904	90	118
6,500	92.4	88.0	0.3135	0.3236	4,000 / 100%	130	0.859	0.947	95	123
7,000	91.6	86.9	0.3064	0.3165	4,000 / 100%	129	0.894	0.986	99	127
8,000	90.4	86.4	0.2952	0.3048	4,000 / 100%	128	0.953	1.051	105	134
9,000	89.4	86.4	0.2869	0.2956	4,000 / 100%	127	1.002	1.105	111	140
10,000	88.8	85.9	0.2806	0.2883	4,000 / 100%	125	1.042	1.149	115	144
12,000	87.6	81.1	0.2718	0.2776	4,000 / 100%	124	1.104	1.218	122	151
14,000	86.5	80.8	0.2659	0.2702	4,000 / 100%	122	1.148	1.266	127	155
16,000	86.1	80.6	0.2618	0.2648	4,000 / 100%	121	1.182	1.304	130	158

Light output category "STANDARD"
Data at T_c = 50°

CCT [K]	general data				visual data (exemplary for a PI-LED SYSTEM with 4 LED modules)		melanopic values (relevant for melanopic light design)			
	CRI	Ra9	CIE-x	CIE-y	ECO lum. flux [lm]	ECO eff. [lm/W]	alpha [smel]	alpha [smel] x correction factor 1.103	Luminous flux [smel, d65] in %	Efficiency [smel, d65] in lm/W
1,800	85.9	62.9	0.5492	0.4082	1,136 / 71%	118	0.249	0.275	19	32
2,000	87.9	71.2	0.5268	0.4133	1,280 / 80%	123	0.291	0.321	26	39
2,500	91.9	91.4	0.4770	0.4137	1,600 / 100%	134	0.388	0.428	43	57
2,700	93.1	94.0	0.4599	0.4106	1,600 / 100%	137	0.425	0.469	47	64
3,000	94.8	94.3	0.4369	0.4041	1,600 / 100%	140	0.477	0.526	53	74
3,500	96.5	94.3	0.4053	0.3907	1,600 / 100%	144	0.556	0.613	61	88
4,000	96.6	94.1	0.3804	0.3767	1,600 / 100%	146	0.628	0.693	69	101
4,500	95.5	93.5	0.3608	0.3635	1,600 / 100%	147	0.691	0.762	76	112
5,000	94.6	92.8	0.3451	0.3516	1,600 / 100%	147	0.749	0.826	83	122
5,500	93.8	91.2	0.3324	0.3410	1,600 / 100%	147	0.800	0.882	88	130
6,000	92.9	89.6	0.3221	0.3318	1,600 / 100%	146	0.845	0.932	93	136
6,500	92.4	88.0	0.3135	0.3236	1,600 / 100%	146	0.886	0.977	98	142
7,000	91.6	86.9	0.3064	0.3165	1,600 / 100%	145	0.923	1.018	102	147
8,000	90.4	86.4	0.2952	0.3048	1,600 / 100%	143	0.985	1.086	109	156
9,000	89.4	86.4	0.2869	0.2956	1,600 / 100%	142	1.036	1.143	114	162
10,000	88.8	85.9	0.2806	0.2883	1,600 / 100%	141	1.078	1.189	119	167
12,000	87.6	81.1	0.2718	0.2776	1,600 / 100%	139	1.143	1.261	126	175
14,000	86.5	80.8	0.2659	0.2702	1,600 / 100%	137	1.190	1.313	131	180
16,000	86.1	80.6	0.2618	0.2648	1,600 / 100%	136	1.225	1.351	135	184

Light output category "ECO"
Data at T_c = 35°

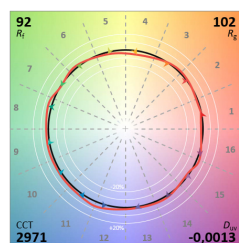
Remark:

The coefficient alpha(smel) describes the melanopic effectiveness of the light source on humans and their circadian rhythm. To give the natural human biorhythm the best possible support, the melatonin production can be minimized by higher values of alpha(smel) throughout the day and stimulated by lower values in the evening.

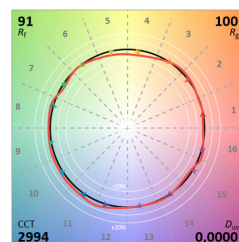
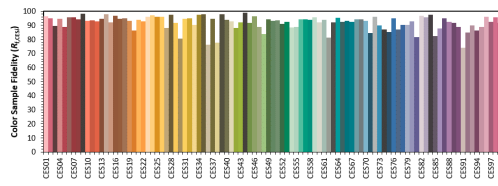
PI-LED enables the implementation of an illumination that is not only visual but also biological/melanopic effective. For a standard-conforming lighting design, Lumitech recommends the document DIN SPEC 5031-100 to be taken as a basis.

LINEAR SYSTEM HD

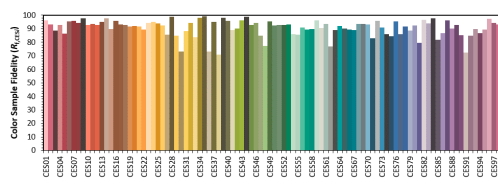
IES TM-30



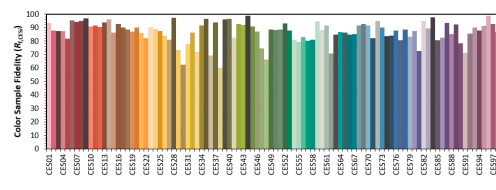
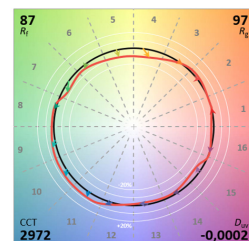
HIGH



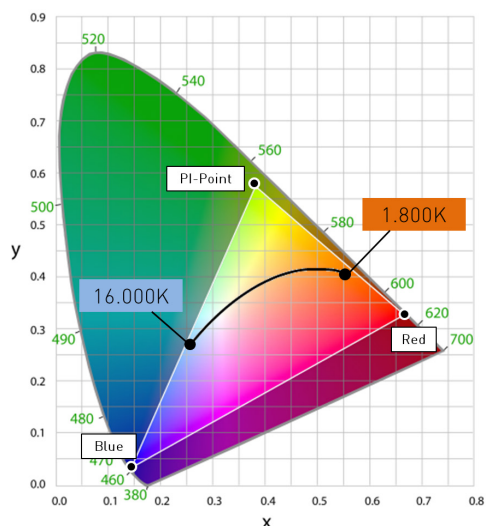
STANDARD



ECO



COORDINATES AND TOLERANCES ACCORDING TO CIE 1931



Representable PI-LED colour space in the CIE 1931 system

If a colour point outside of the triangle (PI-LED colour space) is set, the closest colour point within the triangle is referenced.

LIFETIME LED MODULES

tp [°C]	L80B10 [h]
75°C	50,000

Notes:

- Value L is a statistical value, the actual drop in the luminous flux can vary across the delivered LED modules.
- tp-position = tc-position LED Module

THERMAL CHARACTERISTICS

Ambient temperature	+10°C ... +45°C
Storage temperature	-20°C... +80°C
t _{c,max} LED module	+75°C
t _{c,max} LMU	+65°C

Lumitech PI-LED systems are equipped with integrated overtemperature protection that protects the LED module against thermal overloads.

If the temperature tc at the LED module reaches 75°C, power is reduced by lowering the brightness. If the temperature remains at that level or reaches 80°C, the LED is totally switched off. The LED module is switched on again when the temperature tc drops to below 65°C again.

