

REV 2.4

CLi15 (15 watt)

DALI/Touch/Corridor Dimmable

CoolLED Pro

) LED DRIVERS

15W (up to 1050mA)

The all new CLi LED driver range from Harvard uses uniquely developed technology solutions to achieve high dimming accuracy, safety and reliability in an ultra slim compact format.

This new addition to the CoolLEDpro range offers low dimming to 0.1%.

A new soft on and soft off operation coupled with a range of programmable dimming features, achieves an ideal lighting performance.

The exceptionally low flicker performance over the full operating range means the CLi range can suit the most demanding applications.

- Ultra Compact- Fits through a 40mm hole
- Support for 1-18 LEDs.
- Isolated output.
- Programmable current avaiable.
- Smooth dimming to 0.1%.
- Mains tolerant DALI dimming.
- Touch-dim function as standard.
- Switch-dim (corridor) function as standard.
- Low inrush current.
- Exceptionally low LED flicker. Near perfect light quality.
- Passes IEEE1789:2015
- Power Factor corrected.
- Wireless ready.
- 1-10V/0-10V analogue dimming version available (See separate datasheet)
- Designed in the U.K. Manufactured in India.

Technical Highlights

- Fully programmable in 1mA step increments
- Less than 1% flicker at 100Hz/120Hz -
- Meets IEEE1789:2015 'No Effect' Region 1Hz to greater than 2kHz
- Minimum dimming of 1mA 25 bit dimming resolution
- Small size 21mm x 39.5mm x 133mm (149mm remote version)
- Input voltage range 220-240VAC
- Remote mount version (order end caps separately)
- Up to 15 Years Operation (See Driver lifetime graph for more details) Extensive hot plug protection
- (low output capacitance / additional software protection features) on 01, 02 Models
- Less than 500mW standby power
- Up to 85% efficiency
- Power factor corrected (0.97)
- Operation up to 50°C ambient
- Supports a large LED string voltage range 2V to 38V or 4.5V to 52V (model dependent)

Harvard Power Systems Limited

1200 Century Way, Leeds, LS15 8ZA United Kingdom Tel: +44 (0)113 880 5405 Self-resetting thermal trip

- Mains to LED output: Reinforced isolation 3kV
- DALI to Mains: Basic insulation 1.5kV
- DALI to LED output: Reinforced isolation 3kV
- DALI control standard EN62386
- 100% 0.1% dimming
- Standby mode
- 16 DALI groups, 16 DALI scenes
- DALI LED lamp fault reporting
- Auto selection of DALI/Touch-Dim/Corridor modes
- Surge protection 2kV Differential, 4kV Common mode







Technical Specification

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	15W					
Mains input voltage	220 to 240VAC Nominal					
DC input voltage	220 - 240VDC Nominal / 176 -280VDC Operational range					
Input Current			0.1A			
Input Power			19W Max			
Emergency supply currents		@220VDC - 8	3mA (±10%) / @24	40VDC - 76mA (;	±10%)	
Driver emergency output factor (EOF _I)		1.00 (Light o	output on AC or D	C supply is ider	itical)	
Mains frequency			0/50/60H	Z		
100/120 Hz ripple			<1%			
Flicker		IEEE1789:2	015 compliant wit	h NO RISK cate	gory	
Mains surge protection		4kV con	nmon-mode 2kV c	lifferential-mod	e	
Input-output isolation			3kVAC rm	S		
Mains inrush current	i	25A peak decaying to	zero over 30µS (0	.1R + 100µH ma	ins impedance)	
Number drivers per MCB	B6	B10	B16	C6	C10	C16
(maximum typical)	35	60	100	45	75	120
Output protection	Overvoltage, short, reverse polarity. Auto re-start					
Hot plug protection features	low output capacitance <9 μ F, current limiting and software restart features (01,02 models only)					
Input current THD	8% typical @ full load					
Mains harmonics	IEC/EN61000-3-2 Class C limit, Table 2					
Touch Current	0.28mA (spec limit is 0.7mA) @ 240VAC mains EN60990					
Humidity	85% max non-condensing					
EMC emissions	Meets EN55015:2013. Conducted (9kHz-30MHz), Radiated (30MHz-300MHz)					
Standby power	<0.5W					
'Cold' start-up time	500ms typical					
DALI response time	<50ms (Time to go from standby to on)					
Off load voltage	<58V					
Ambient temperature range	-25°C to 50°C					
Maximum Tc temperature	80°C					
Dimming range	100 - 0.1% (See models for minimum current)					
Dimming method	Linear amplitude dimming (No PWM dimming)					
Dimming port classification	FELV (DALI) / LV (Switch + Touch Dim)					
Terminal blocks	45° Push fit connectors, Input: 7mm pitch, Output/DALI: 3.5mm pitch					
Enclosure	White polycarbonate UL94-V0 rated					
Wire size	0.5mm ² to 1.5mm ² (20-16 AWG)					

Case Style	Dimensions	Weight	Box Quantity	IP Rating
Integral	133.3mm x 21mm x Ø39.5mm	92g	ТВС	N/A
With cable clamps	149mm x 21mm x Ø39.5mm	100g	ТВС	IP40

Operation

*Drivers are suitable for DC & AC operation at 0/50/60 Hz and compliant to EN50172. The operation is compliant to EN 60598-2-22 except with the 'high risk task lighting' applications.







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LED DRIVERS



Insulation classes for isolated circuits *fff* model isolation barrier definition

Dimming Information / Diagrams

The driver is primarily a DALI dimming product, but two other functions; Touch Dim and Switch dim (corridor) are included as standard. Selection of the three different dimming modes is automatic and depends upon the nature of the signals present on the terminal block marked 'DA/N' and 'DA/SL'.

For Installation guide: See website.

DALI mode

At mains power-on, the driver looks for DALI signals. If present, DALI mode is locked. To reset, interrupt mains supply for 15 seconds.



Touch Dim: Dimming by pushing and releasing a momentary contact mechanical switch Automatically activated.

Touch Dim Operation	Contact Duration	Driver response
Very short push	0 to 0.04s	Ignore
Short push	0.04 to 0.4s	Toggle on/off
Long push	0.4 to 10s	Dim up or down. Release switch to set light intensity
Reset push	More than 10s	Driver reset (Light goes to 50%)





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Switch Dim (Corridor): Light control between two levels by means of an electronic proximity sensor

To activate, apply signal from the sensor for at least 4 minutes (Note light will dim to minimum then after 10 seconds go to 50%). After 4 minutes, the driver is locked into Switch Dim mode.

Normal operation: With no signal present, output is 10%. When requested by the sensor, the output will quickly rise to 100%. When an off signal is received from the sensor, the output will slowly fade back to 10%.

For custom settings, please enquire (www.harvardps.com).

Note Should a driver accidentally get into Switch Dim mode on a Touch Dim system, then 3 very brief button presses in less than 2 seconds will clear the driver back to Touch Dim mode.



Operating Range (undimmed)



LED constant current is set in software according to application/customer requirement.





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Efficiency





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Variants

Part number	Programmable Current Range	LED String Voltage	Max. Tc Temperature	Ambient Temperature Range	Thermal Trip (Self - resetting)	Maximum Power	Power factor at full load	Efficiency at full load	Minimum Dimmed Current
CLi15-D01-240/xxxx	100 - 1050mA (±5%)	2.5V to 38V	80°C	-25 - 50°C	100°C	15W	0.97	85%	1mA
CLi15-D02-240/xxxx	100 - 700mA (±5%)	4.5V to 52V	80°C	-25 - 50°C	100°C	15W	0.97	85%	1mA
CLi15-D05-240/xxxx	100 - 1050mA (±5%)	2.5V to 38V	80°C	-25 - 50°C	100°C	15W	0.97	85%	350µA
CLi15-D06-240/xxxx	100 - 700mA (±5%)	4.5V to 52V	80°C	-25 - 50°C	100°C	15W	0.97	85%	350µA

To order, customer replace xxxx with the required LED current in mA Order Examples: CLi15-D01-240/1050, CLi15-D02-240/350

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Dimensions

Integral style





Cable clamps (remote) style

For remote mount, cable clamps are required Order CLi15 clamp kit part number: CLi-CC39-SET





Compliance

Designed to meet the following:

Approval	Standards
CE (Europe)	LVD:2014/35/EU, EMC:2014/30/EU, RoHS:2011/65/EU, ECOD/2009/125/EC
ENEC (Europe)	EN61347-1:2015, EN61347-2-13+A1:2017+ANNEX J, EN62384+A1:2009
CB (International)	IEC61347-1:2015, IEC61347-2-13+A1:2016+ANNEX J, IEC62384+A1:2009
RCM (Australia/NZ)	ASNZS61347.1:2016, ASNZS61347.2.13:2013, ASNZS-CISPR15, ASNZS4417.1:2012
DALI dimming	EN62386-101, EN62386-102, EN62386-207



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