

# Tuneable White Products

IL#-OW##-####-PC221-WIR200.

**Tuneable White – a range of products to help you mix warm and cool white light and light intensity, so that you can mimic outdoor lighting conditions, where morning light has different colour and intensity than midday light or evening light.**

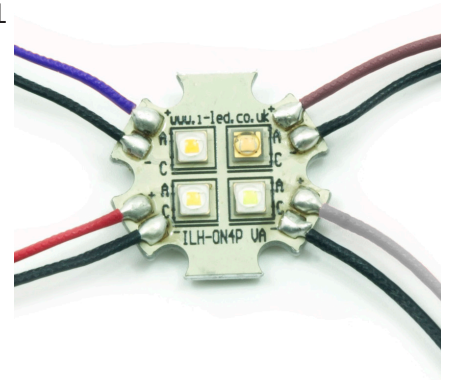
## Product Overview

The Tuneable White range of products from ILS, utilise the very latest OSOLON® SSL 150 ThinGaN devices from Osram Opto Semiconductor.

OSOLON® SSL can be driven up to 1300mA while OSRAM's latest power chip technology remains efficient even at the highest drive currents.

A low thermal resistance of 7K/W ensures cool running and a highly efficient product. The Tuneable White products utilise a mixture of different white colour temperatures on a single product. By varying the current through each of these different LEDs you can vary the output colour across a range of colour temperatures.

The combination of small light-emitting surface and high lumen package provides excellent optical control and very narrow angle design. Tuneable White products are compact, powerful LED light sources built on aluminium substrates for optimal thermal management. Available with 200mm wires as standard.



## Applications

- General Lighting
- Decorative Lighting
- Task Lighting
- Spot Lighting
- Downlighters
- Retail and Entertainment Lighting

## Technical Features

- ILS Tuneable Whites contain OSOLON® SSL 150 LEDs with integral 150 degree silicon resin Lenses
- Up to 100,000 Hour lifetime to 70% of original brightness
- Mounting holes using M3 screws allows easy installation
- Size (L x W x H):
  - 4 LED version: 20mm x 20mm x 3.85mm
  - 9 LED version: 20mm x 20mm x 3.85mm
  - 16 LED version: 25mm x 25mm x 3.85mm
- Available with 200mm connecting wires
- Secondary reflectors can be fitted – check the reflector section
- Suitable Heat Sinks available – check options in Heat Sink section
- Matching Power Supply available - check options in Power Supply section
- Tuneable White Products can be linked together to produce longer chains
- Current range 100 to 1,300mA

\*This datasheet should be read in conjunction with the relevant OSRAM Opto Semiconductors data on the LED used

### Important Information and Precautions

- The Tuneable White LEDs, when powered up, are very bright. Thus it is advised that you do not look directly at them. Turn the Tuneable White product away from you and do not shine into the eyes of others.
- Tuneable White products will overheat in operation if not attached to a suitable Heat Sink. Overheating can cause failure or irreparable damage.
- Do not operate Tuneable White products with a Power Supply with unlimited current. Connection to constant voltage Power Supplies that are not current limited may cause the Tuneable White product to consume current above the specified maximum and cause failure or irreparable damage.
- Tuneable White products, when operated, can reach high temperatures thus there is risk of injury if they are touched.
- DO NOT HOT PLUG ON LED SIDE OF POWER SUPPLY
- DO NOT TOUCH or PUSH on the LED as this might cause irreparable damage.

### Product Options

ILS PART NUMBER	Colour temp on board*	No. of each led on board	Colour Temp typical wattage §		Colour Temp forward voltage	Colour Temp Typical Flux at 350mA †	Radiance angle	Relevant Osram LED data
			@ 350mA	@ 700mA				
ILH-OW04-HWUL-PC221-WIR200.	2700K	2	2.18 watts	4.34 watts	5.4 to 7 volts	260lm	150° (±75°)	GWCSHPM1.EM
	6500K	2	2.18 watts	4.34 watts	5.4 to 7 volts	280lm	150° (±75°)	GWCSHPM1.PM
ILH-OW04-HWNU-PC221-WIR200.	2700K	1	1.09 watts	2.17 watts	2.7 to 3.5 volts	130lm	150° (±75°)	GWCSHPM1.EM
	3000K	1	1.09 watts	2.17 watts	2.7 to 3.5 volts	130lm	150° (±75°)	GWCSHPM1.CM
	4000K	1	1.09 watts	2.17 watts	2.7 to 3.5 volts	140lm	150° (±75°)	GWCSHPM1.EM
	6500K	1	1.09 watts	2.17 watts	2.7 to 3.5 volts	140lm	150° (±75°)	GWCSHPM1.PM
ILR-OW09-HWNU-PC221-WIR200.	2700K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	390lm	150° (±75°)	GWCSHPM1.EM
	3500K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	390lm	150° (±75°)	GWCSHPM1.EM
	4000K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	420lm	150° (±75°)	GWCSHPM1.EM
ILR-OW09-HQUX-PC221-WIR200.	2700K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	390lm	150° (±75°)	GWCSHPM1.EM
	3500K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	390lm	150° (±75°)	GWCSHPM1.EM
	6500K	3	3.27 watts	6.51 watts	8.1 to 10.5 volts	420lm	150° (±75°)	GWCSHPM1.PM
ILR-OW16-HWUL-PC221-WIR200.	2700K	8	8.72 watts	17.36 watts	21.6 to 28.0 volts	1040lm	150° (±75°)	GWCSHPM1.EM
	6500K	8	8.72 watts	17.36 watts	21.6 to 28.0 volts	1120lm	150° (±75°)	GWCSHPM1.PM
ILR-OW16-HWNU-PC221-WIR200.	2700K	4	4.36 watts	8.68 watts	9.6 to 14 volts	520lm	150° (±75°)	GWCSHPM1.EM
	3000K	4	4.36 watts	8.68 watts	9.6 to 14 volts	520lm	150° (±75°)	GWCSHPM1.CM
	4000K	4	4.36 watts	8.68 watts	9.6 to 14 volts	560lm	150° (±75°)	GWCSHPM1.EM
	6500K	4	4.36 watts	8.68 watts	9.6 to 14 volts	560lm	150° (±75°)	GWCSHPM1.PM

\*Due to the special conditions of the manufacturing processes of LEDs, the typical data of technical parameters can only reflect statistical figures and do not necessarily correspond to the actual parameters of each single product which could differ from the typical data.

§ Tolerance +/- 10%

† Measured with 20mS 350mA pulse at 25 °c

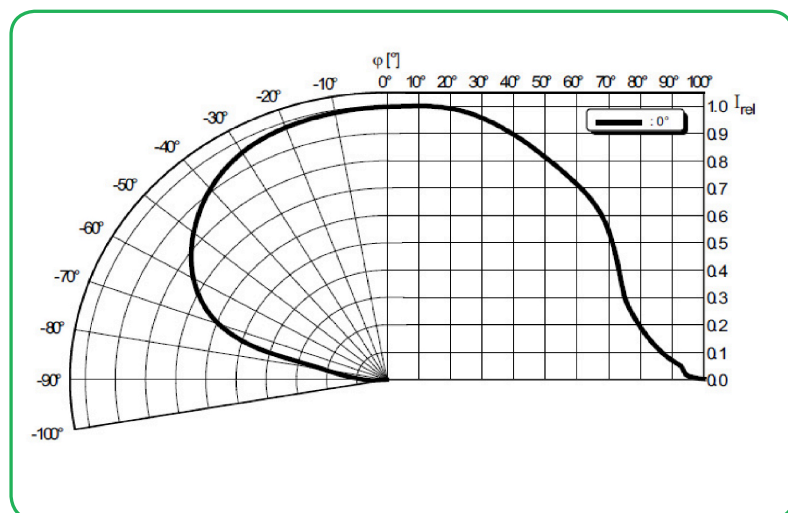


### Minimum and Maximum Ratings

ILS PART NUMBER	Operating Temperature at Tc-Point [ °C ]*	Storage Temperature [ °C ]*	Forward Current per chip [ mA ]*	Reverse Voltage [ Vdc ]*
ILH-OW04-HWUL-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage
ILH-OW04-HWNU-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage
ILR-OW09-HWNX-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage
ILR-OW09-HQUX-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage
ILR-OW16-HWUL-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage
ILR-OW16-HWNU-PC221-WIR200.	70 °C max	- 40 to 110 °C	1,300mA max	not designed for reverse voltage

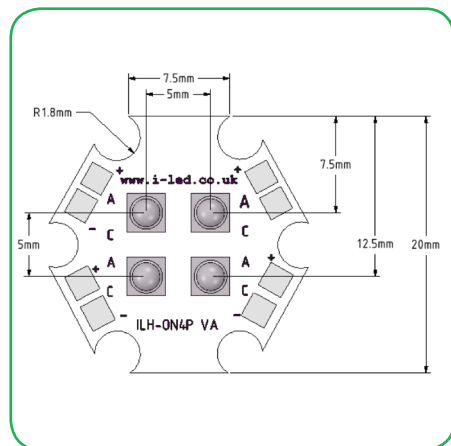
\* Exceeding maximum ratings for operating and storage temperature will reduce expected life time or destroy the LED module.  
 Exceeding maximum ratings for operating voltage will cause hazardous overload and is likely to destroy the LED module.  
 The temperature of the LED module must be measured at the Tc-Point according to EN60598-1 in a thermally constant status with a temperature sensor or a temperature sensitive label.

### Radiation of Single LED

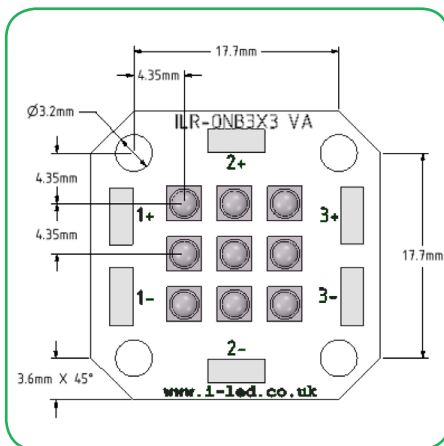


Technical Drawing with Cables (mm)

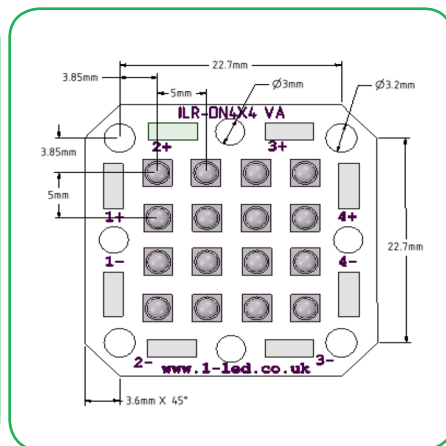
ILH-OW04



ILR-OW09



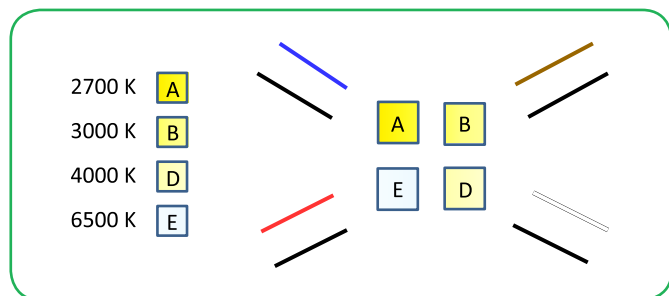
ILR-OW16



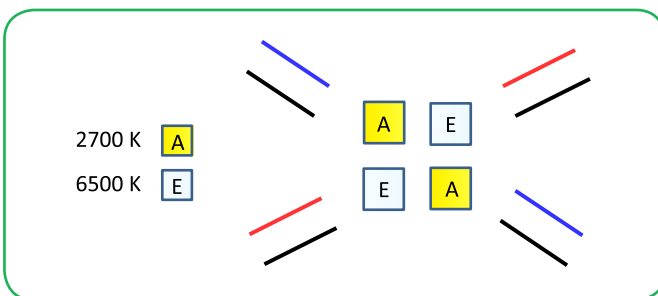
3D drawing files are available on request from ILS. Please call or email

Assembly Drawings

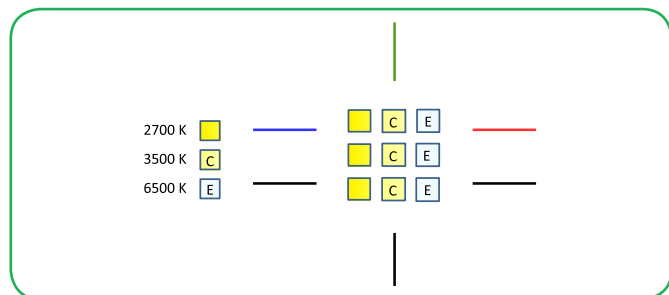
ILH-OW04 - HWNU



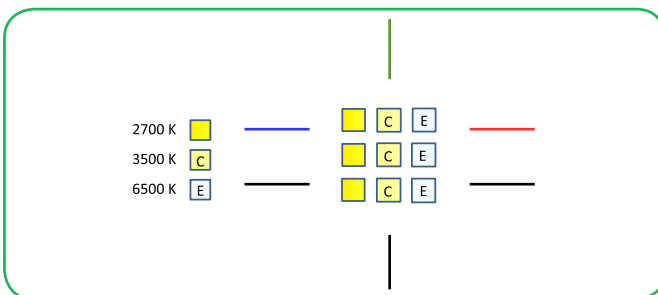
ILH-OW04 - HWUL



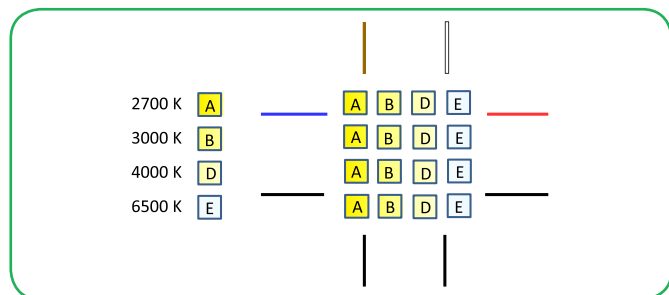
ILR-OW09 - HWNX



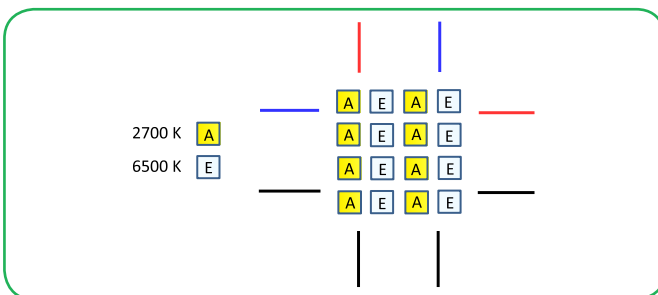
ILR-OW09 - HQUX



ILR-OW16 - HWNU



ILR-OW16 - HWUL

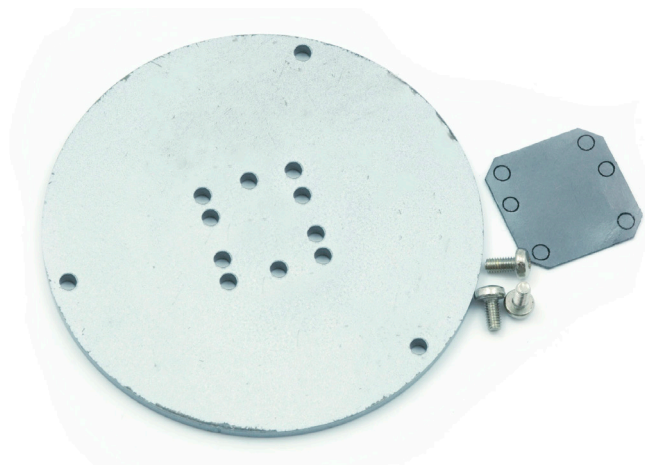


### Tuneable White Reflector Options

LEDiL precision-engineered Lenses and Reflectors allow for rapid deployment of all types of light fixtures, including street lights, wall-wash, high-bay, sconces, emergency beacons, parking garage/low-bay, MR and AR down lights, and dock lights. Precision-engineered for maximum efficiency and durability, LEDiL Lenses and Reflectors are released alongside the latest product releases from our LED suppliers. You select the best LED for the application; choose LEDiL and you're selecting the best optical solution as well.

By utilising the ILS ILA-REF-ADP-xxxxxxx-01 adaptor plate, it enables our Tuneable White products to be used with hundreds of reflector options.

Please refer to the ILA-REF-ADP-xxxxxxx-01 datasheet.

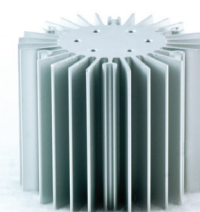


### Tuneable White Heat Sink Options

ILS has introduced a series of Aluminium Alloy Heat Sinks to be used with our standard range of PowerStars and PowerClusters. These Heat Sinks are supplied with fixing screws for the light engine and for fixing to a base plate. They also come with Thermal Interface Material (TIM) attached to the top surface. More versions will be introduced over the coming months and we are happy to manufacture custom Heat Sinks to your request.

	Operates under the recommended ILS junction temperature
	Operates under the recommended LED maximum junction temperature
	Not suitable for use
	N/A Heat Sink not designed for use with this product

ILS Product		No Heat Sink, in free air	ILA-HSINK-STAR-50X20MM.	ILA-HSINK-STAR-50X40MM.	ILA-HSINK-STAR-50X60MM.	ILA-HSINK-STAR-50X80MM.	ILA-HSINK-CLUSTER-70X70X55MM.	ILA-HSINK-CLUSTER-78X46X25MM.
ILH-OW04	350mA							
	700mA							
	1000mA							
ILR-OW09	350mA							
	700mA							
	1000mA							
ILR-OW16	350mA							
	700mA							
	1000mA							



## Tuneable White Power Supply Options

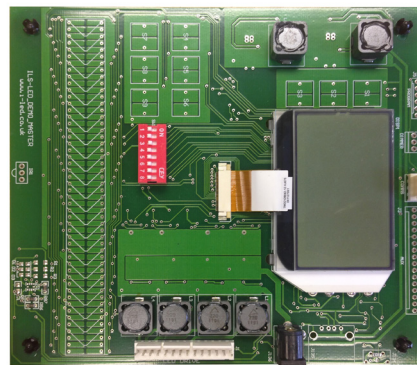
### ILA-4CHANNEL-LED-TUNER-001.

ILS have developed a power supply to help in the development of Tuneable White and RGB/RGBW products, or any system that requires up to 4 channels of controllable LED driving.

Each of the four channels can deliver 48v at a maximum drive current of 999mA.

The ILA-4CHANNEL-LED-TUNER-001 has 2 modes of active operation;

- Programmed mode
- Standalone



Standalone mode gives you full control over all 4 channels, you can set max currents, dimming ranges etc, and once you have got your desired settings you can save them for use later in stored mode.

Programmed mode allows you to write your own channel control with per second timing. This is all created in excel and is imported into the ILA-4CHANNEL-LED-TUNER-001 via a USB memory stick. Multiple profiles can be stored onto the USB key, and then selection is via the on-board LCD.

The ILA-4CHANNEL-LED-TUNER-001. is aimed as a development tool to make driving complex LED systems easy, for a proof of concept or evaluation.

### Technical Features

- 4 independent 999mA, 48v channels
- 128x64 LCD for easy control
- Compact 150mm x 150mm desktop unit
- User upgradeable to be able to drive all future ILS products
- Simple standard Pin header output
- Requires a 48v DC external power supply
- Easy to use multi coloured Display
- Easily create scenes such as sunrise or white colour sweep

### Thermal Interface Material Options

ILS have produced a range of High-performance, cost effective Thermal Interface Materials to match perfectly their standard products.

Our product fills the air pockets between the two surfaces, forming a continuous layer to conduct heat away from the LED to the Heat Sink.

ILS offer our TIM in three options – double sided adhesive, single sided adhesive and non adhesive.

Product	Non Adhesive	Single Sided Adhesive	Double Sided Adhesive
Star	ILA-TIM-STAR-0A	ILA-TIM-STAR-1A	ILA-TIM-STAR-2A.
25x25mm Cluster	ILA-TIM-CLUSTER-25x25-0A	ILA-TIM-CLUSTER-25x25-1A	ILA-TIM-CLUSTER-25x25-2A.
30x30mm Cluster	ILA-TIM-CLUSTER-30x30-0A	ILA-TIM-CLUSTER-30x30-1A	ILA-TIM-CLUSTER-30x30-2A.
300x20mm Strip	ILA-TIM-STRIP-300x20-0A	ILA-TIM-STRIP300x20-1A	ILA-TIM-STRIP-300x20-2A.
25x15mm Strip	ILA-TIM-STRIP-25x15-0A	ILA-TIM-STRIP-25x15-1A	ILA-TIM-STRIP-25x15-2A.
58x58mm Square	ILA-TIM-SQUARE-58X58-0A	ILA-TIM-SQUARE-58X58-1A	ILA-TIM-SQUARE-58X58-2A.

Other sizes are available, including customised parts

## Assembly Information

- The mounting of the Tuneable White has to be on a metal Heat Sink.
- In order to optimise the thermal management, the metal surface needs to be clean (dirt and oil free) and planar for the best contact with the LED module. A thermal grease or heat transfer material is highly recommended.

## Safety Information

- The LED module itself and all its components must not be mechanically stressed.
- Assembly must not damage or destroy conducting paths on the circuit board.
- The mounting of the module is carried out by attaching it at the mounting holes. Metal mounting screws must be insulated with synthetic washers to prevent circuit board damage and possible short circuiting.
- To avoid mechanical damage to the connecting cables, the boards should be attached securely to the intended substrate. Heavy vibration should be avoided.
- Observe correct polarity!
- Depending on the product, incorrect polarity will lead to emission of red or no light. The module can be destroyed!
- Pay attention to standard ESD precautions when installing the Tuneable White.
- The Tuneable White, as manufactured, have no conformal coating and therefore offer no inherent protection against corrosion.
- Damage by corrosion will not be accepted as a materials defect claim. It is the users responsibility to provide suitable protection against corrosive agents such as moisture and condensation and other harmful elements.
- For outdoor usage, a housing is definitely required to protect the board against environmental influences. The design of the housing must correspond to the IP standards in the application. It is also the responsibility of the user to ensure any housings or modifications keep the Tc junction temperature to within stated ranges.
- To also ease the luminaire/installation approval, electronic control gear for LED or LED modules should carry the CE mark and be ENEC certified. In Europe the declarations of conformity must include the following standards: CE: EC 61374-2-13, EN 55015, IEC 61547 and IEC 61000-3-2 - ENEC: 61374-2-13 and IEC/EN 62384.
- The evaluation of eye safety occurs according to the standard IEC 62471:2006 ("photobiological safety of lamps and lamp systems"). Within the risk grouping system of this CIE standard, the LED specified in this data sheet falls into the class "moderate risk" (exposure time 0.25s). Under real circumstances (for exposure time, eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. As is also true when viewing other bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment and even accidents, depending on the situation.

## For further information please contact ILS

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.