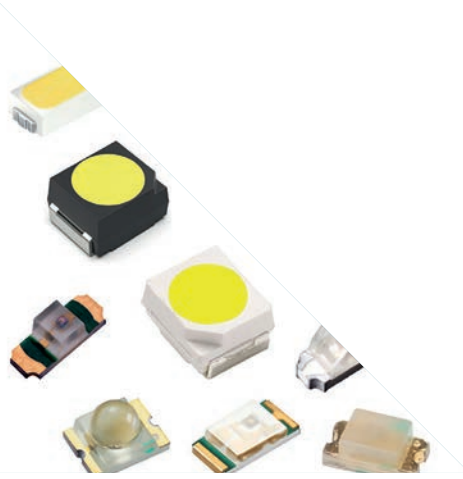
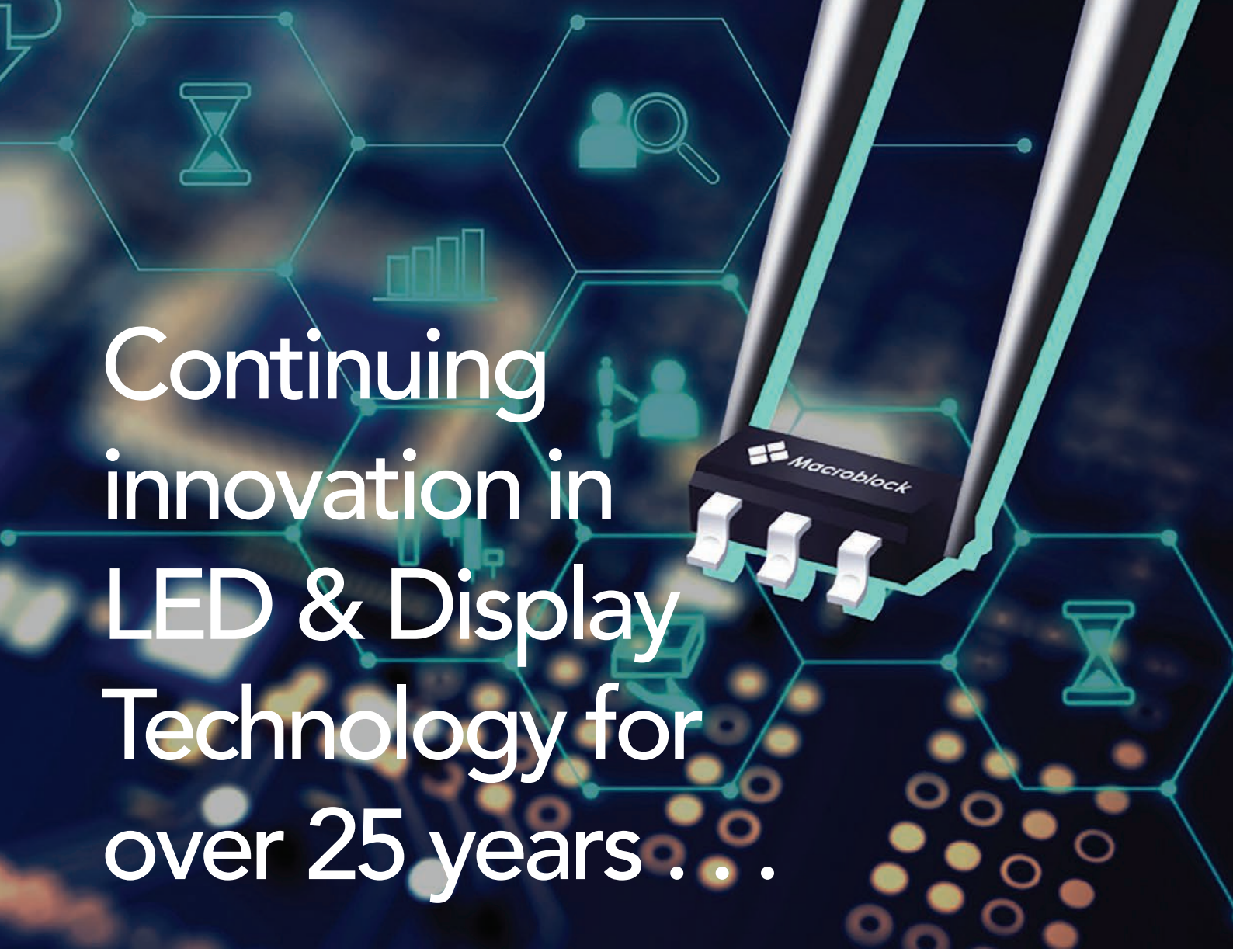
plus Opto

THE OPTOELECTRONIC SPECIALISTS

ProductShowcase





Continuing innovation in LED & Display Technology for over 25 years . . .

Plus Opto was established in 1994 and continues to innovate with a focus on optoelectronic solutions, across an increasing range of products and applications. Developments in LED chip materials, technologies and production methods have resulted in significant growth in LED usage and new applications. Key markets include: information displays, fire & security systems, signalling, architectural, commercial & retail lighting. Our LED products are supported with a range of Drivers & Controllers maximising light performance.

Alongside its established LED activity Plus Opto continues to build its display business based on LCD technology from one of the world leaders, Winstar Display Co. Based in Taiwan, Winstar Display Co. offers an extensive range of LCD Modules including traditional character & graphic modules in STN, FSTN and VATN technologies. High performance displays using PMOLED and TFT technology provide significant advantages over traditional designs offering high resolution, colour and high contrast. Winstar continue to innovate with the latest IPS technology and Smart Displays driving new innovation into the market.

System Integration can be realised through a range of Smart Displays and single board computer modules from Winstar

Technology, ranging from low-cost integrated ARM-based SBCs to fully enclosed IP-rated plug and play HMI modules.

Commitment to customer service is demonstrated in our comprehensive UK stockholding and efficient order processing. Full technical support is available on all products.

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If you would prefer to receive your Plus Opto Product Showcase electronically, please email your full name to sales@plusopto.co.uk with Product Showcase in the subject line.

About us . . .

Established in 1994 as a specialist supplier of optoelectronic components into the electronic manufacturing industry, our continued success is based upon well-maintained traditional values: quality, customer service and technical support.

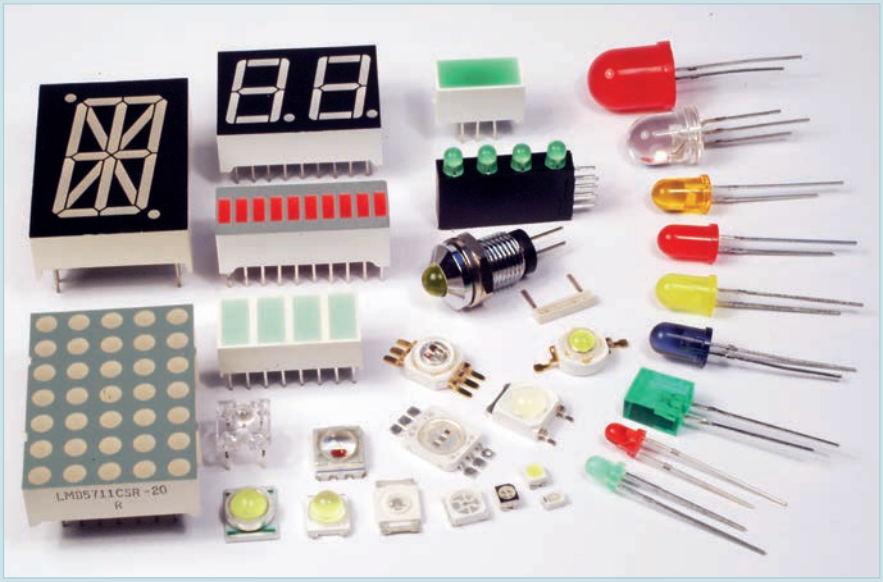
Plus Opto is home to the complete range of optoelectronic devices and systems: LED discrete components & assemblies, displays and modules; LCD Modules; Single Board Computers, LED Drivers & Controllers as well as custom and semi-custom displays and assemblies.

In an ever-advancing industry, with the emergence of many new opportunist enterprises, the significance of our experience in direct application support for new project development cannot be underestimated. Our thorough understanding of markets, trends and applications, using the very latest in LED technology and production techniques is of fundamental importance to our customers.

Supported by a comprehensive UK stocking facility and direct factory routes our clients profit from a highly competitive product range and short delivery times, thus instilling confidence that we are indeed dedicated to building ongoing working relationships.

Stock Policy - Our commitment to customer service is directly reflected in our stocking policy whereby several million components are held in stock at any time. Our stock investment is under continuous appraisal to ensure that we meet customer demands. Items that are not held in stock can be obtained on the shortest possible delivery times by close liaison with our suppliers.

Our strategic partners and suppliers include:



LED emitters are now well established as reliable and efficient light sources. The development of new materials, production equipment & techniques continues to advance and offers long life, low degradation and a wide choice of wavelengths and CCT options.

Encompassing virtually every size, shape and style of LED lamp in through hole or Surface Mount, our comprehensive range of LED components allows an increasing number of applications to be realised.

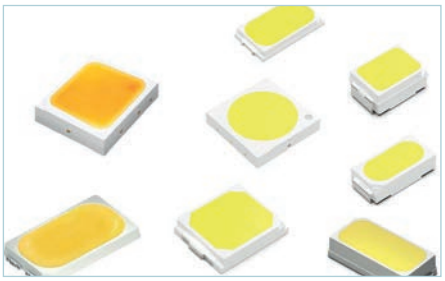
Our range of LED components extends to Displays, Indicators and Arrays supported from strategic manufacturing partners.

Low Power LEDs

With the increase in demand for portability and reduced equipment size where PCB area is at a premium, Surface Mount LEDs offer a cost-effective solution.

- PLCC-2, PLCC-4, PLCC-6 & Side Emit packages
- High performance, high efficiency
- Lensed variants
- Choice of mono colours & RGB
- Reduced assembly cost due to auto insertion

Applications range from general indication, displays, LED assemblies & modules.



Mid Power LEDs

Our range of mid-power LEDs are capable of handling higher drive currents to produce high luminous output from compact packages.

- 2835, 3030, 5050, 5630 package options
- High efficiency >160lm/W
- Choice of mono or multicolour
- Tight binning system for consistency
- Range of secondary optics available
- Addressable options with integral driver IC
- High CRI

High Power LEDs

At the forefront of new and exciting lighting designs, our range of high power LEDs are capable of handling higher drive currents to produce high luminous output.

- Industry standard packages optimsed for power
- Choice of power ratings
- Choice of wavelength/CCT
- Tight binning system for consistency
- High CRI
- Range of secondary optics available

Our LED Our emitters can be supplied mounted on rigid strip, flexible strip or as a custom assembly

Chip LEDs

Produced in high volume for use in compact designs, chip type surface mount LEDs provide an excellent solution for applications where space is at a premium.

- Standard packages 0402 to 1206 & side emit
- Choice of colours including RGB
- Lensed variants
- Wide angle or lensed types
- Supplied on 8mm tape & reel for auto Insertion

Applications include indicator lamps, switches and backlighting arrays. A range of optical light guides is also available for application flexibility.

Multi-Chip COB LEDs

Our range of COB multi-chip LED arrays are designed for high-intensity lighting applications and are available in power ratings up to 200W.

Features include:

- High flux output
- High efficiency up to 190lm/W
- High CRI
- Low thermal resistance, excellent heat dissipation
- Choice of colour temperatures
- Standard and custom formats
- LM-80 certified & Zhaga compatible

Multi-colour LEDs

Our range of multi-colour LEDs incorporate multichip emitters in a single package.

Choices include:

- 3-chip RGB
- 3-chip RGBW
- 5-chip RGB+CT
- Pixel Addressable

Packages include

- Chip LED
- 3535
- 5050

Features include low power consumption and wide angle of emission.

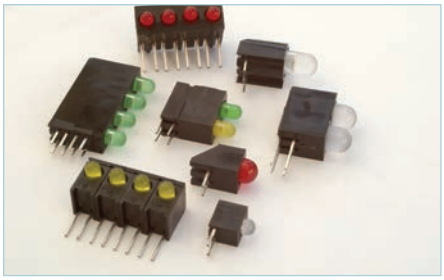
Through-Hole LEDs

Our extensive range of high-performance LED lamps covers almost all industry-standard devices, at extremely competitive prices.

Virtually every size, shape and style of LED lamp is available with a wide range of colours and a choice of lens options.

For volume requirements we offer lead cropping and / or pre-forming, wire lead termination and tape & reel packaging for automatic insertion.

LEDs from Blue Chip suppliers such as Nichia, Osram, Dominant, Ligitek, Samsung , Refond, Everlight, Philips and Cree.



PCB Indicators

To facilitate ease of assembly we offer a wide range of PCB Indicators based on discrete LEDs packaged in housings.

Options include:

- Choice of LED sizes 2.0 to 20mm diameter
- Choice of colours / permutations
- Vertical or right angle orientation
- Choice of clear, tinted or diffused lens
- Ultra bright, low current, bi-colour, and flashing

Panel Mount Indicators

For status indication in panel applications we offer a range of panel-mount LED indicators.

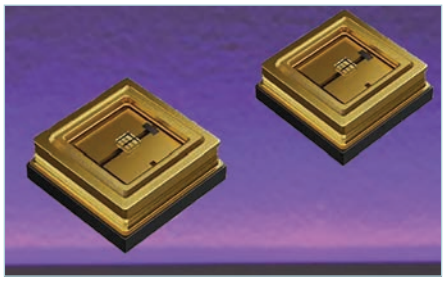
Features include:

- Rugged construction
- Choice of bezel styles, sizes & finishes
- Range of operating voltages from 12V to 230VAC
- Choice of emitted colours
- IP rated options
- Termination by rigid wire lead, faston tab or flying leads

Plus Opto is the UK Agent and stocking Distributor for Ligitek Electronics

Infra Red Products

From low cost 3mm and 5mm plastic IR emitters & detectors through to photodiodes hermetically sealed devices, we offer a wide range of infrared products and the latest high power 3535 infra red devices with a variety of output options. Transmissive and Reflective switches provide solutions in position sensing and control applications. Receiver modules offer integrated modular solutions for remote control systems. Where circuit isolation is required optocouplers form an integral part of the design, with a series of generic part numbers with relevant safety approvals where required.

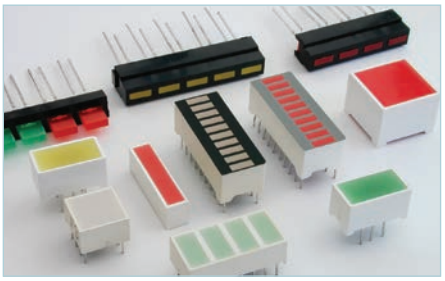


UV Products

With the advances in UV LED chip efficiencies & packaging, Ultraviolet LED light sources are now able to fulfil a range of diverse applications where filament lamps were traditionally used, including chromatography, photo-lithography and curing of compounds & resins. UV LEDs suit applications in environmental monitoring, life science and sterilization. Our UV LEDs are available in a range of wavelengths and power ratings.

Features include:

- Spectral range 200-280nm
- Choice of packages
- Low, Mid and high power ratings
- Choice of emission angles
- COB Chip-on-Board Modules



LED Light Bar & Bargraph Arrays

For legend illumination, backlighting and small area illumination we offer a range of multi-chip Light Bars and Bargraph arrays.

Features include:

- SIL and DIL format
- Single
- x / y stackable
- Choice of colours & permutations

LEDs are matched for uniform intensity and colour. Applications include: solid state metering, audio monitoring, level display and instrumentation.

LED Accessories

To assist the application of our products we offer a range of accessories to ease assembly, & improve performance & reliability.

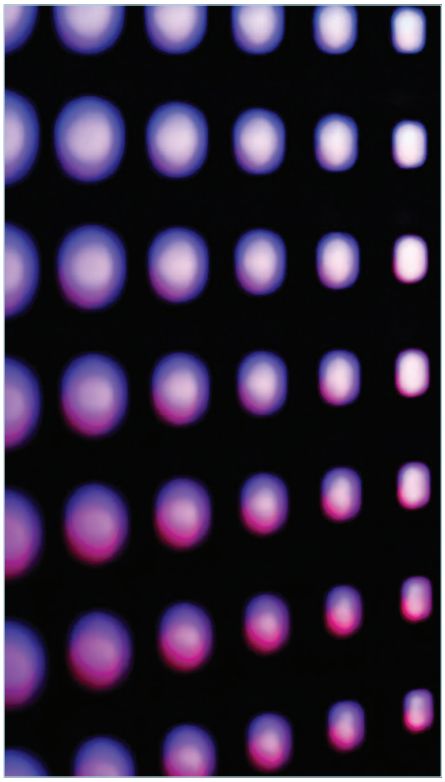
- Support hardware: Spacers, bezels, grommets and clips
- Lenses, reflectors and mounts
- Light Pipes: Rigid and flexible light guides
- Interconnection: Cables, distribution boxes and connectors

In addition we can offer custom moulding, flying wire leads and connector attach to customers' specification.

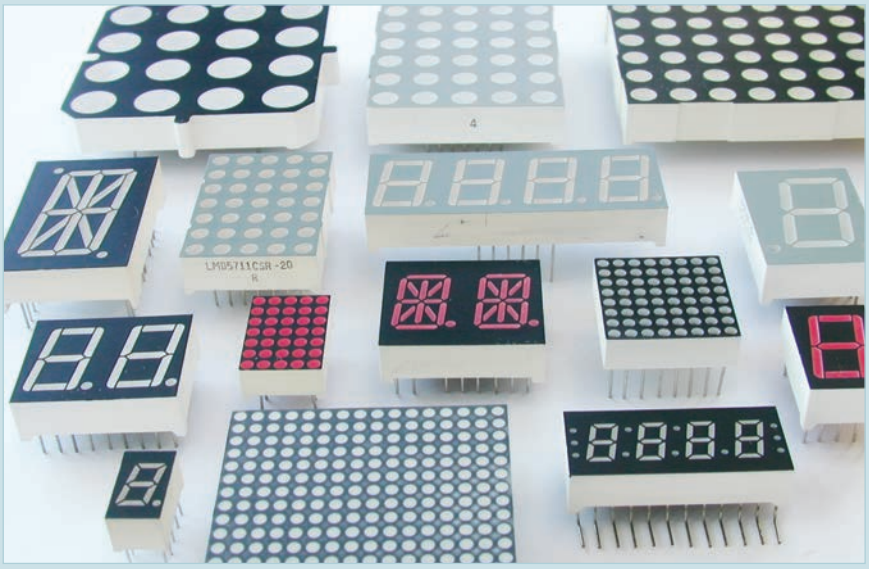
Secondary Optics

To support our range of LED emitters we offer a range of advanced optics to maximize efficiency and provide beam directivity.

- High optical performance
- Choice of beam angles
- Elliptical pattern types
- Multi-cell optic modules
- Street Lighting modules
- Design and mould tooling facilities



Our LED Our emitters can be supplied mounted on rigid strip, flexible strip or as a custom assembly

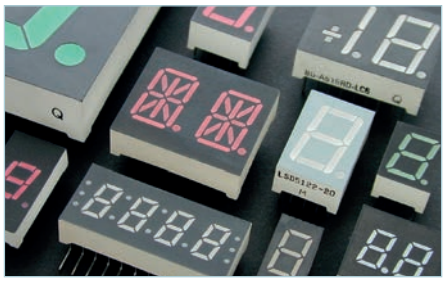


Our extensive range of LED Displays is available in a spectrum of colours for high visibility applications.

Types include:

- Alphanumeric types in 14 & 16 segment format
- Dot Matrix displays 5x7, 5x8, 8x8, 16x16
- Custom displays

All industry standard character heights and pin-out configurations are supported. To ensure consistent matching across multi line displays, parts are supplied categorised for colour and intensity.



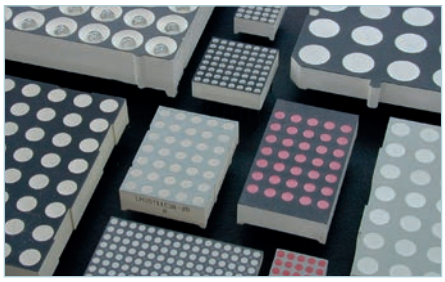
Numeric LED Displays

Our range of Numeric LED Displays encompasses digit heights ranging from 0.28" to 12.0" and virtually all industry standard types are supported.

Options include:

- High intensity sunlight view
- Low current
- Multi-colour and custom types

Multiple digits range from dual to six way with pin-outs configured for ease of connection when multiplexing. Displays are available in both Common Anode and Common Cathode polarity and for optimum viewing and contrast the segment and surface colour may be selected.



Dot Matrix LED Displays

For high visibility information display, Dot Matrix LED displays offer a modular solution and may be used as building blocks in both small and large systems.

Formats include:

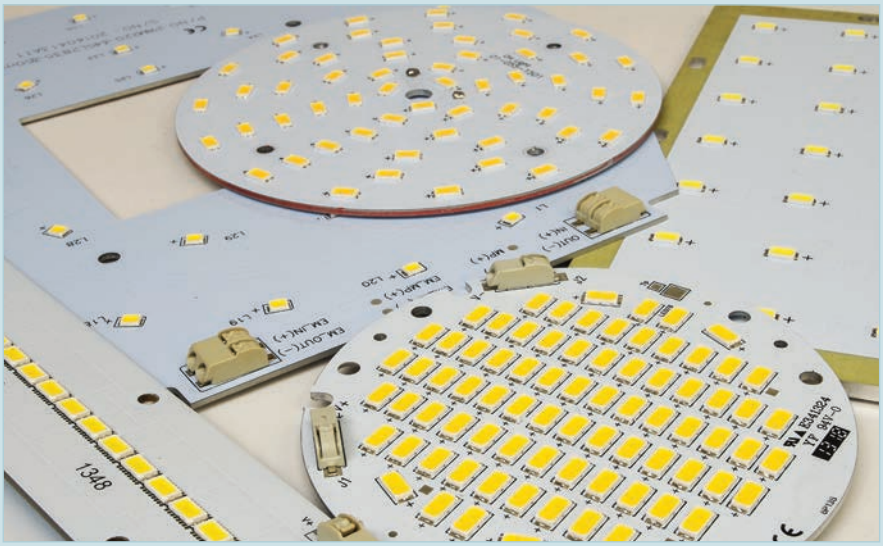
- I5x7, 5x8, 8x8 & 16x16
- Displays are x, y, stackable and available in CA and CC polarity, segment and face colour can also be selected
- Displays are supplied categorised for luminous intensity and hue

Custom LED Displays

Formatting dedicated characters and icons in compact modules allows customer specific functions to be displayed and tailored to the equipment and application. For flexibility of information, custom arrays can be configured with a choice of colour permutations using LED chips as light sources.

Features include:

- Integrated driver IC's
- High readability in bright conditions
- Wide viewing angle
- Bendable (max 30°)
- Low power consumption
- Thin profile
- Robust package and long life



We offer a convenient, ready-made solution to LED lighting requirements from a range of standard LED Light Engines. Designed for downlights, linear fluorescent replacement, and bulkhead luminaires, these LED Assemblies are designed specifically for lighting applications.

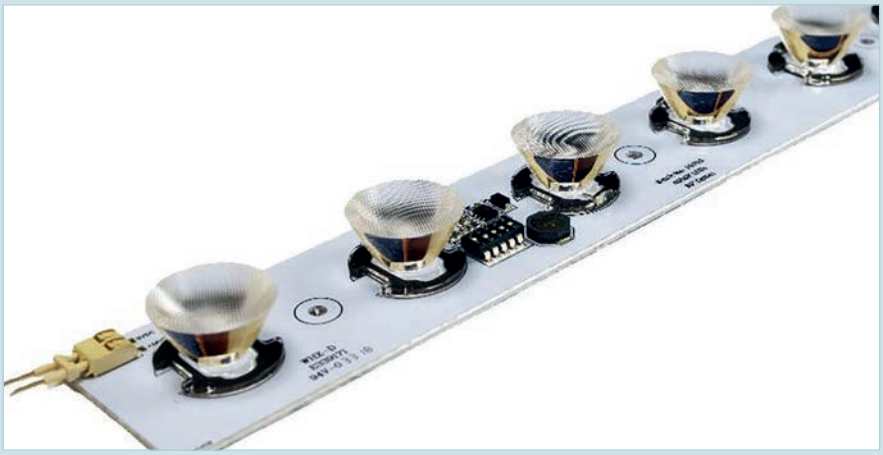
Light Engines are offered in a choice of shapes and sizes along with a bespoke design service to provide custom solutions for a wide range of applications.

These products are complemented with an extensive range of LED drivers & controllers

We offer a bespoke design service to develop LED Assemblies and Light Engines for your specific application. A wide choice of shapes and sizes can be produced along with on- board or external drive, control solutions, interconnect and optics.

Options include:

- Custom dimensions
- Choice of LED type density / intensity
- Choice of power ratings
- Choice of colours / white CCT
- Multi-colour RGB and RGBW
- Tuneable white, adjustable CCT
- On-board drivers & control options
- Choice of Optics



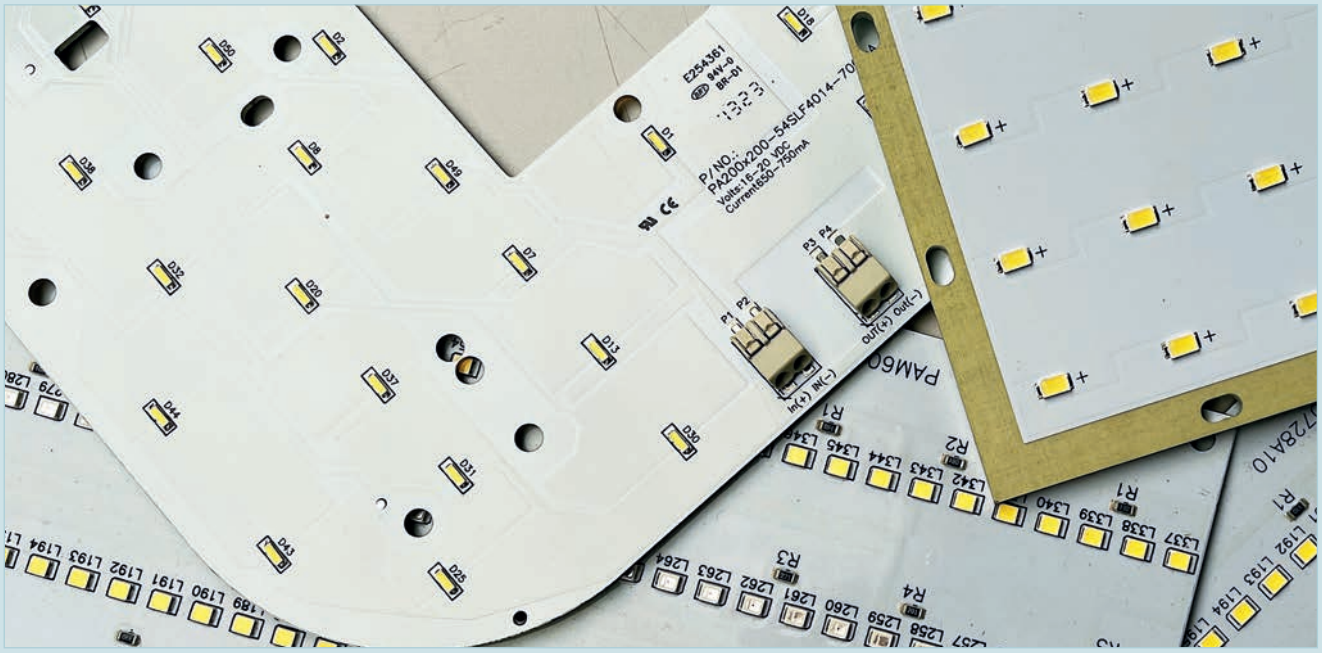
Plus Opto is the authorised UK distributor for Signify

To meet customers' increasing demand to adopt LED technology we offer a bespoke design service to develop LED Modules and Light Engines to meet specific applications.

A wide choice of shapes and sizes can be produced along with on-board or external drive and control solutions.

Applications include Industrial & Commercial lighting, point-of-sale and retail lighting.

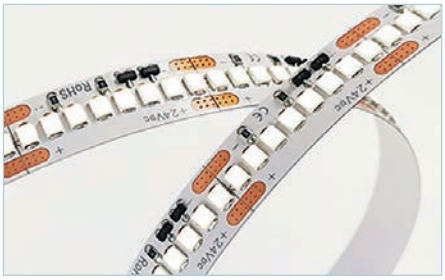
We offer wide range of Linear LED systems which are the ideal solution for LED luminaires which traditionally would have been equipped with fluorescent tubes. Our Linear LED systems portfolio consists of two main brands from Philips, Fortimo and CertaFlux. Fortimo equals an exceptional quality of light, the highest energy efficiency and lifetime and a five year system warranty. Many of our Light Engines are Zhaga compliant and are supported by Interconnection and LED Driver & Control solutions.



Also termed as LED tape or LED ribbon, we offer an extensive range of low voltage flexible LED strips & sheets for decorative and professional lighting features.

- Wide choice of colours/CCT
- Choice of LED type density / intensity
- Choice of IP ratings
- High CRI types
- Multi-colour RGB, RGBW, RGB+CT
- Tuneable white, adjustable CCT
- Pixel Addressable LED strips
- Choice of Optics

These products are complemented with an extensive range of LED drivers & Controllers.



Mono-colour & White Flexible Strip

Our mono-colour flexible LED strips encompasses a wide range of LED emitter types for a wide range of lighting applications. For high colour rendering CRI >90 can be specified.

- Choice of packages
- Choice of LED density
- Choice of power ratings/intensity
- Choice of IP ratings, IP20, IP65, IP67, IP68

Multi-colour Flexible Strip

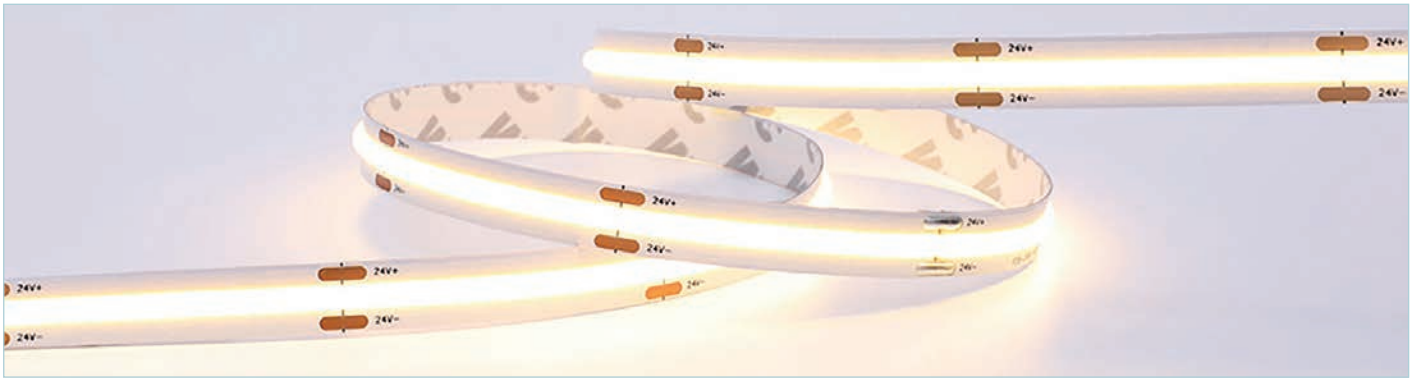
To create a palette of colours and colour changing effects we offer a range of multi-colour flexible LED strips using Red, Green Blue (RGB) and White LED emitters.

- Choice of packages
- Choice of LED density
- Choice of power ratings/intensity
- Choice of IP ratings, IP20, IP65, IP67, IP68

White Tuneable CT Flexible Strip

To create a palette of colours and colour changing effects we offer a range of multi-colour flexible LED strips using Red, Green Blue (RGB) and White LED emitters.

- Choice of packages
- Choice of LED density
- Choice of power ratings/intensity
- Choice of IP ratings, IP20, IP65, IP67, IP68



We offer an extensive range of pixel Addressable digital LED strips based on the SPI (Serial Peripheral Interface) control protocol reducing the amount of cabling and connections required.

Addressable LED pixels allow users to create dynamic lighting effects along linear LED strip that may be adjusted to produce the desired lighting effect.

Digital Addressable LED strip is supported by a range of SPI controllers and DMX interfaces facilitating larger lighting schemes.

Neon Flex Strip

We offer a range of Flexible Neon LED Strip to provide a rugged solution for linear lighting applications in rugged environments. Designed as an upgrade alternative to traditional glass neon, the construction is resistant to abrasion, chemicals & salt water. The silicone diffusion produces a smooth even illumination with no spotting.

- Choice of profiles
- Choice of colours
- Choice of power ratings/intensity
- Waterproof to IP67 and IP68

Flexible LED Light Sheet

Our range of Flexible LED Light Sheets are designed for back lighting of surfaces and Lightboxes. The range of flexible LED light sheets comprise of a grid array of LED emitters that offer low proximity backlighting that may be cut at intervals. A bright & even surface illumination is achieved from the thin panel with a choice of white colour temperatures, tuneable white and multi-colour. Sheets may be connected together in x, y configuration to produce large surface areas. Applications include showroom illumination, retail lighting, countertop backlighting and surface lighting.

Waterproof LED Modules

Designed for channel letter illumination and backlighting in signage applications we offer an extensive range of low voltage waterproof LED modules.

Modules are supplied in pre-wired strings for ease of installation with 3M adhesive tape applied for fixing.

Single or multi-LED types:

- Choice of 12V or 24VDC output
- Choice of LED emitter type
- Choice of configuration
- Choice of colour/CCT
- Full colour RGB versions

Please refer to our range of drivers, controllers and connection solutions to support our Rigid & Flexible Strips

The Benefits

Low Voltage
Safe low voltage operation

Long Life
LED lifetimes exceed 50,000 hours L70

Maintenance Free
Fit and forget

Energy Efficient
Over 10x more energy efficient

Cool Running
No radiated heat

Highly Durable
Resistant to Temperature, Shock & Vibration

True Colours
Wide range of colours including White

Temperature Resistant
Operation across a wide range of temperatures

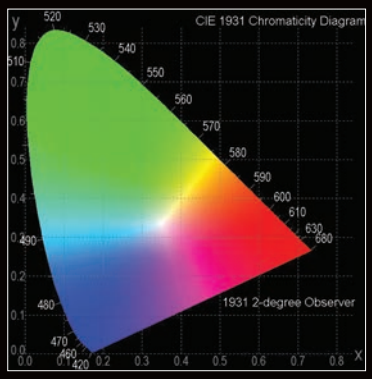
Flexible Drive
Instantaneous switching, ability to colour change

Cherry Red 660nm	Bright Red 625-630nm	Sunset Orange 623nm
Orange 605nm	Amber 590nm	Yellow 585nm
Yellow/Green 570nm	Green 525/530nm	Cyan 505nm
Blue 470nm	Cool White 7000/10000°K	Pure White 5650/7000°K
Neutral White 4500/5650K	Natural White 3500/4500°K	Warm White 2850/3500°K

LED quality - Bin grading for consistency

Most applications require a high level of consistency of colour and intensity particularly where multiple emitters are used in arrays in applications such as luminaires, linear arrays, displays and signs.

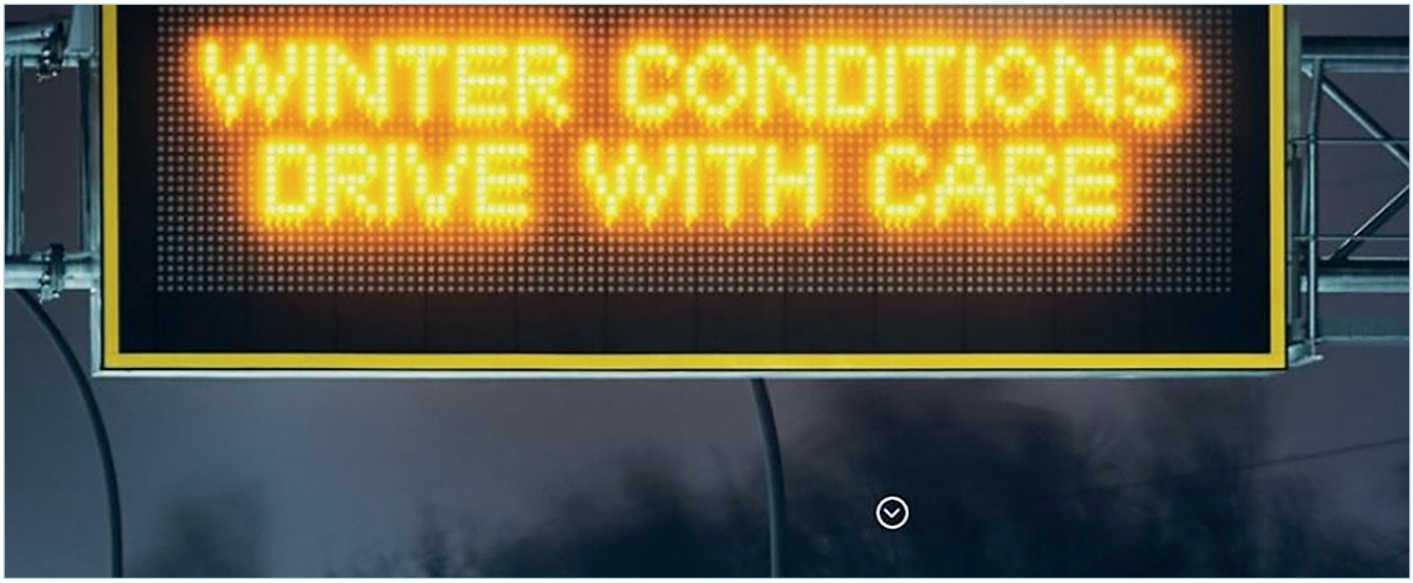
LED binning is essential in order to maximise effective utilisation of emitters in applications. Binning for light output, and particularly colour, ensures consistency of performance. Our binning for colour is defined by (x,y) coordinates on the CIE 1931 Chromaticity Diagram. We provide binning to ANSI standard, and MacAdam Ellipse Standard Deviation of Colour Matching (SDCM) which is a zone within the colour space that the human eye cannot perceive.



LED selection for high performance applications

LED Bin selection is essential where multiple emitters are placed together for example in information signs. All our suppliers offer tight binning to ensure consistency of colour/CCT and intensity which is also important to control the binning on our range of linear, flexible strips and modules.

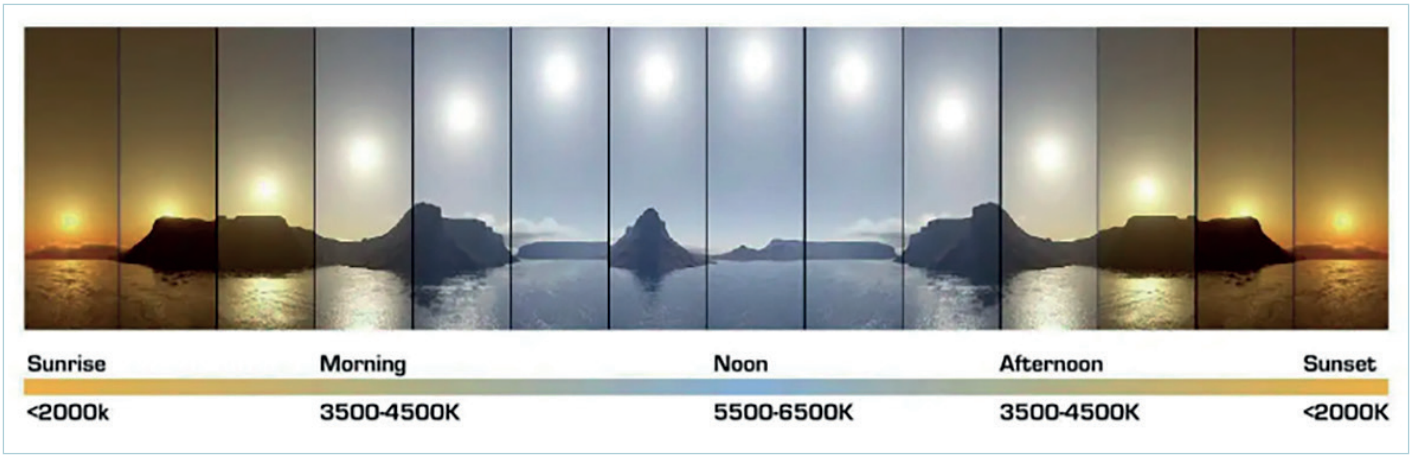
For high end applications such as Automotive and Outdoor Signs it is critical that temperature and humidity are considered along with a robust drive circuit design which can be facilitated from our range of Macroblock driver IC's.



LED quality - Colour Temperature

LED colour temperature is measured on the Kelvin scale (K) and indicates the warmth or coolness of the light. Lower Kelvin values (around 2700K) represent warm, yellowish light, while higher values (around 6500K) indicate cooler, white light. This affects the perceived mood and ambiance of a space, with warmer lights being more relaxing and cooler lights being more stimulating

Visual illustration of White Colour temperature (CCT)



LED quality - Colour rendering for accurate representation

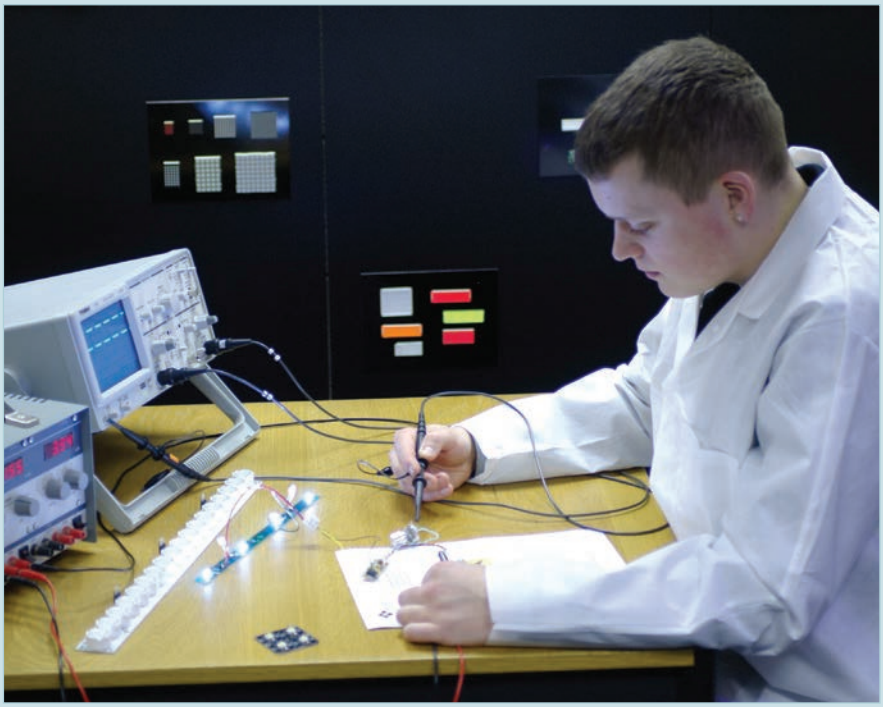
Colour Rendering Index (CRI) is a quantitative measure of the ability of a light source to reproduce the colours of various objects faithfully in comparison with an ideal or natural light source.

Colour rendering is essential for high quality colour representation in applications such as photography, retail store displays, grocery and food store lighting, art illumination.

High CRI of 90

Low CRI of 80

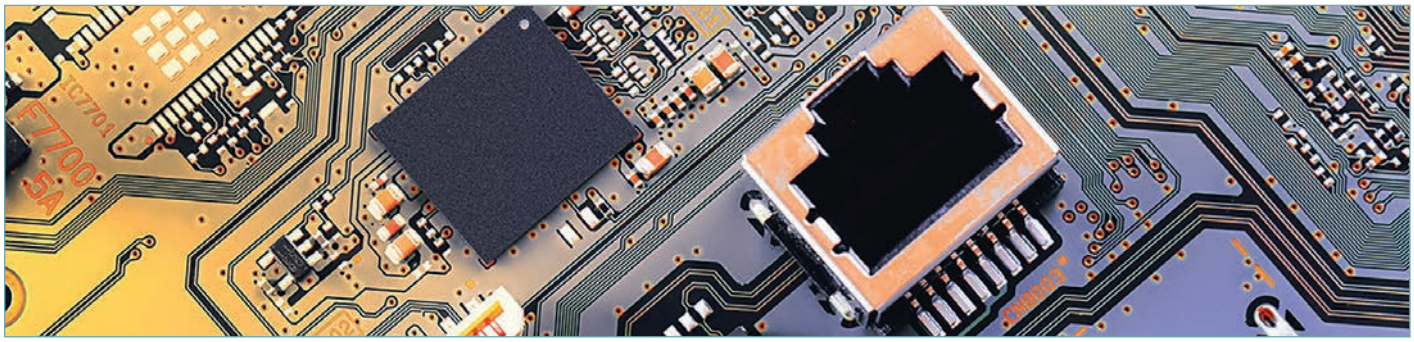
Visual illustration of White Colour rendering (CRI)



We offer a bespoke design service to assist our customers in the development of LED lighting solutions for a wide range of applications, including POS, vending, merchandising, accent lighting, Signalling and displays or any application that requires illumination.

Our services include:

- Concept analysis
- PCB design
- Prototyping servics
- Evaluation boards and demo kit
- Intensity and spectral measurement
- LED selection and binning
- Tooling
- Samples & pre-production quantity
- Connection solutions



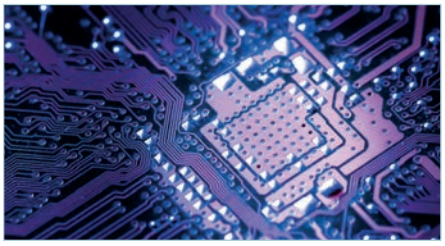
Benefits

Benefits of our design include:

- Low client cost Value engineering
- Flexibility of design
- Complete "Turn Key" solutions
- Shorter "time to market

Applications include:

- Commercial Lighting
- Retail Lighting
- Architectural Lighting
- Signage & Advertising Lighting
- Signalling



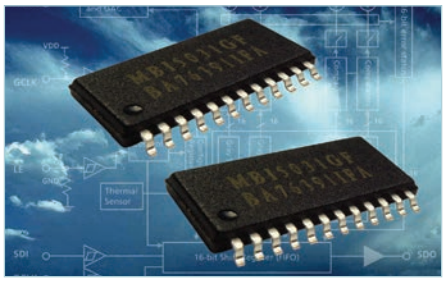
To assist in the design and application of our products we can provide equipment to demonstrate the appearance and function of our Displays, LCDs and LED drivers & Controllers.

Our sales team-would be pleased to arrange an on-site visit to physically demonstrate and discuss the various features and benefits of specified products.

In addition we offer bespoke demo kit to support the development of customer specific applications.

Macroblock

Macroblock is a world leading manufacturer of LED drivers and focuses IC designs for optimum performance in LED display and lighting on applications. Their technology has been seen in major worldwide events such as the 2008 Beijing Olympics. Macroblock's patented S-PWM (Scrambled-PWM) technology enhances Pulse Width Modulation by scrambling the image into sub-images, giving increased refresh rate, avoiding flicker and improving fidelity. The Precision Drive series features +/- 1.5% current accuracy within a single driver, and between lots to enhance output characteristics. IC protection and error detection functions feature on many devices. The wide range and continuing technology advances make Macroblock the first choice in LED drivers.



LED Display Drivers

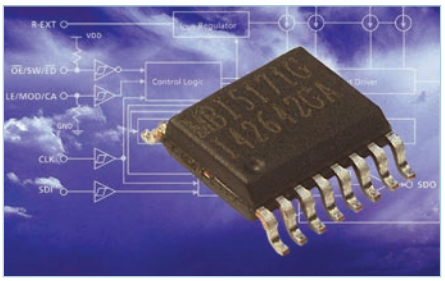
Macroblock is a leading supplier of LED display driver IC's its products have been selected and applied in many world class landmarks & events along with specific requirements such as control rooms Macroblock offer.

- 8,16 & 16 channel constant current drivers
- LED error detection
- Open circuit detection
- (S)PWM control
- Free design tools

LED Lighting Drivers

Macroblock provides a diverse product portfolio of LED lighting drivers including linear regulators, DC/DC controllers and converters. These drivers enhance long distance transmission and reduce signal distortion.

- Ease of use and low BOM cost
- Accurate current that gives precise LED colour tuning
- Protection that enhances system reliability
- Flexible and accurate dimming
- Free design tools



LED Backlighting Drivers

Macroblock offers a variety of solutions for LED backlighting applications and feature excellent current accuracy and PWM function to provide dynamic colour & greyscales.

- Ease of use and low BOM cost
- Accurate current that gives precise LED colour tuning
- Protection that enhances system reliability
- Flexible and accurate dimming
- Free design tools

Plus Opto is the UK Agent and stocking Distributor for Macroblock Driver IC's

LED LIGHTING

A natural extension of our range of LED components and assemblies is the development of LED lighting products.

Products include:

- LED Light Panels
- Linear LED Lighting
- LED Downlights

Applications include:

- Commercial Lighting
- Retail Lighting
- Architectural Lighting
- Signage & Advertising Lighting

Using the latest materials and production techniques, LED chip efficiency continues to increase, facilitating new products with high intensity light output and low energy consumption. LED technology is widely adopted in lighting schemes with the benefits of low power consumption, low heat generation and long lifetimes. These products offer a high quality, reliable lighting solution reducing energy and maintenance costs. A range of standard replacement products in a spectrum of colours allows the retrofit and replacement of existing lamps. In addition we offer a standard range of fittings along with a custom design service for specific applications.

We offer an extensive range of linear LED fittings designed for a wide range of lighting applications. A choice of profiles, light sources, optics and drive solutions facilitate creative lighting schemes.

Features include:

- Wide choice of profiles
- Choice of LED emitter types
- Choice of colours / white colour temperatures
- Full colour RGB, RGBA, RGBW & RGBWW
- Diffused, Frosted or Clear filter
- Optics
- Choice of IP ratings
- Custom lengths cut to suit the application

Choice of colours / white colour temperatures

LED Profiles

We offer a wide range of high quality anodised aluminium LED profiles designed for linear LED lighting schemes, supported by filters, covers, diffusers, End Caps, Fasteners, and accessories. These profiles are designed to accept our range of flexible & rigid LED strip and offer solutions in installations including Suspended, Recessed, Surface Mounted, Corner and In-ground. Profiles not only increase the scheme aesthetics and quality of light appearance but provide protection for LED strips and thermal management.

These products are complemented with an extensive range of LED Drivers & Controllers

LED Downlights

Our range of LED Downlights are designed as replacements for traditional incandescent lighting reducing maintenance and energy costs. Incorporating the latest LED technology to maximise performance, light output and lifetimes, the range encompasses miniature types from 3W to larger high flux fittings up to 60W.

LED Light Panels

Philips Fortimo LED Panels are designed to integrate into suspended ceiling grids for office & commercial lighting. The ultra-slim design facilitates easy installation and the panels are designed to meet office illumination standards offering excellent performance and high quality of light. An integrated sensor option is available along with a wide choice of Xitanium drivers for flexible drive & control solutions.

Interconnection

To facilitate ease of connection for LED strips, assemblies & modules we offer a variety of interconnection solutions from basic link cables, wire and connector attach, distribution boxes and in- line IDC connectors for the connection of flexible LED strips.

Our lighting assemblies are supported with interconnection solutions, drivers & controllers

To support our extensive range of LED products and facilitate reliable, efficient power management we offer a number of solutions for driving LEDs in Constant Voltage and Constant Current Mode. A choice of packages is available for a wide range of environments and applications.

- Choice of package style, metal or plastic
- Choice of IP ratings
- Choice of terminals/connection
- Certified to international approvals
- Fixed output or dimmable
- Selectable output currents
- Architectural Lighting
- Remote programming

Fixed output LED Drivers

For a fully packaged LED driver solution we offer a range of constant current and constant voltage drivers designed to operate from AC mains supply. These drivers comply with international standards and feature short circuit, overload and thermal protection.

- Output power ratings 1W to 600W
- Choice of construction & IP ratings
- Optional dimming functions
- Choice of connection

Dimmable LED Drivers

Macroblock provides a diverse product portfolio of LED lighting drivers including linear regulators, DC/DC controllers and converters. These drivers enhance long distance transmission and reduce signal distortion.

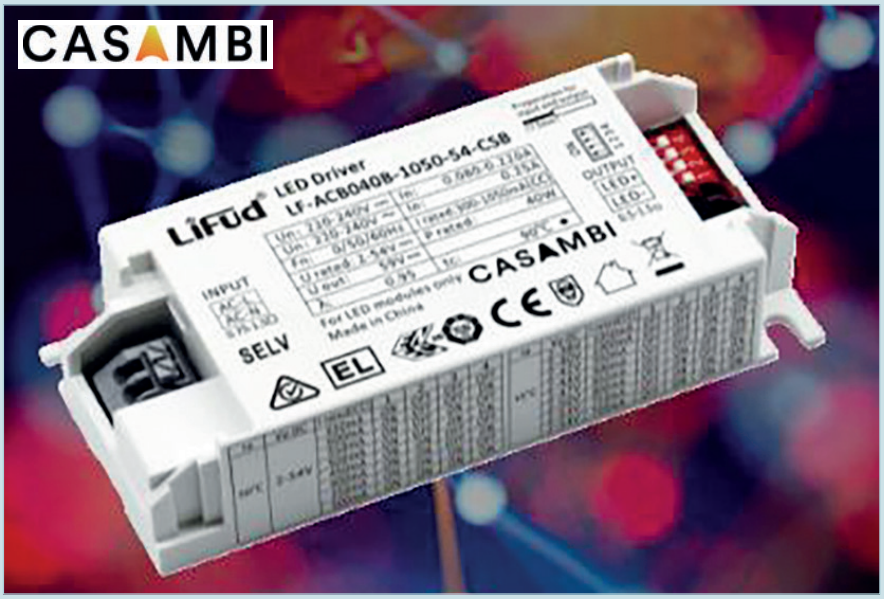
- AC mains dimming
- 0/1-10v dimming
- DALI dimming
- RF dimming Zigbee and Bluetooth
- Fixed resistance dimming
- DMX512 control dimming
- Casambi control
- Push and step dimming
- Multiple dimming options in a single driver

Programmable LED Drivers

Xitanium full programmable LED drivers are designed to deliver the highest performance, reliability and configuration possibilities. The portfolio offers both stand-alone and remote dimming protocols to further decrease energy use, with the latest LED technologies. Configuration of these drivers can be done via both the universal DALI or with SimpleSet, which is the latest technology for reliable, fast and easy altering and read out of settings.

- Wide AC mains input voltage
- Multiple control interfaces
- DALI dimming
- Constant light output
- Adjustable start-up time
- Adjustable light output
- Bluetooth control dimming

Plus Opto is the authorised UK distributor for Signify



Casambi Smart LED Drivers

Casambi is a fast growing wireless control system designed for professional lighting control based on the Bluetooth Low Energy protocol, allowing enabled products to communicate. This smart lighting solution allows mesh communication from virtually any mobile device, facilitating flexibility for remote network operation and control of connected LED lighting products. Units may be connected directly or via a network and are also supported by dedicated remote controls, wall plates, switches, sensors and drivers with support Apps for iOS or Android mobile devices.

Waterproof LED Drivers

For a fully packaged LED driver solution we offer a range of constant current and constant voltage drivers designed to operate from AC mains supply. These drivers comply with international standards and feature short circuit, overload and thermal protection.

- AC mains dimming
- 0/1-10v dimming
- DALI dimming
- RF dimming Zigbee and Bluetooth
- Fixed resistance dimming
- DMX512 control dimming
- Casambi control
- Push and step dimming
- Multiple dimming options in a single driver

Compact LED Drivers

For outdoor and industrial applications we offer a range of compact LED drivers for cost effective solutions in a wide range of installations.

Our range supports fixed output control and dimmable protocols including:

- AC mains dimming
- 0/1-10v dimming
- DALI dimming
- RF dimming Zigbee and Bluetooth
- Fixed resistance dimming
- Push and step dimming
- Multiple dimming options in a single driver

Compact Sensors & Switches

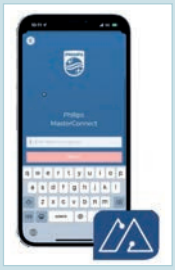
For occupancy and ambient light control we offer Casambi enabled PIR sensors suitable for easy installation.

Configurable for any room occupancy style, via the free to download Casambi APP on Google Play or Apple APP Store.

- Through hole flush mount
- Surface mount
- AC mains input 220-240VAC
- RF 2.4GHz

Philips Masterconnect System

The Philips Masterconnect system enables you to create connected lighting installations that are simple and scalable, more sustainable due to significant energy savings, and with no hassle during installation and commissioning. And, with our continuously improved software and added hardware for many different applications, you can master connected lighting in no time, anytime.



Wireless Nodes, Drivers, Integrated and External Wireless Sensors and Switches

Simple - Easy installation

Wireless retrofits, no need for a gateway and the intuitive mobile app guided set up make installation quick and hassle free

Scalable - For every system

Simply add a gateway to enjoy all the benefits of cloud-based systems - without the need to rewire or upgrade existing components

Standardized - Open standards, more choice

From simple stand-alone solutions to sophisticated gateway solutions, you can create every configuration of connected system using the same suite of components

Sustainable - Energy savings

MasterConnect combined with LED lighting offers significant energy savings: save up to 40% compared to non-controlled LED lighting and up to 75% compared to conventional lighting

Connected lighting made simple, scalable, and standardized

To support our range of assemblies and lighting products we offer an extensive portfolio of LED controllers and drivers to provide control solutions.

Protocols include:

- AC mains dimming control
- Analogue 0/1-10v dimming control
- DALI dimmable
- RF dimming Zigbee and Bluetooth
- SPI control
- DMX512 control
- Bluetooth control
- Casambi control

Touch Panel Controls

We offer a range of single and multi-zone, wall mounted, touch panel LED controllers with a choice of protocols designed to be easily mounted into a standard single gang wall plate. Control may be via horizontal touch bar or colour wheel.

Control options include:

- Single or multi-zone control
- CT, RGB, RGBW and RGB+CT
- RF interface to, Bluetooth, WiFi and Zigbee receiver drivers

We also offer rotary type wall controllers.

Hand-held Remote Controls

To control our range of receiver drivers we offer a choice of hand-held remote controllers designed for the control & drive of LED strip and fittings.

Control options include:

- Single or multi-zone control
- CT, RGB, RGBW and RGB+CT
- RF interface to, Bluetooth, WiFi and Zigbee receiver drivers

Mobile App Control

To control our range of receiver drivers we offer the facility for mobile app control designed for the control & drive of LED lighting schemes.

Control options include:

- Single or multi-zone control
- SCT, RGB, RGBW and RGB+CT
- Connect via Bluetooth or WiFi to receiver drivers

A wide choice of interconnection options are available, distribution boxes and cabling solutions

We offer an extensive range of Liquid Crystal Displays (LCDs) that have been developed to accommodate the increased requirement for information display. Liquid Crystal Displays offer a low current, high-resolution solution in applications where the display of data in the form of text or graphics is required.

Our product technologies include:

- TFTs
- OLED Displays
- STN Character & Graphic
- Smart Displays
- Touch Screens

STN Displays

We offer a wide portfolio of STN LCD Modules Character Modules: Best for alphanumeric text and simple symbols, using a 5x8 dot matrix for efficient text-based applications. Graphic Modules: Ideal for detailed graphics and complex data visualization with pixel-based displays.

- Graphic Displays
- Character Displays
- COG Displays
- VATN Displays
- FSC Displays

OLED Displays

Passive Matrix OLEDs (PMOLED) offer many advantages over traditional LCDs and are being designed into a growing range of equipment and applications.
Available in graphic and character formats, OLEDs bring a modern, high- tech look and feel to your fascia.

OLED features include:

- Fast Response Times
- Wide 175° viewing angle
- Low Profile - no backlight required
- High Brightness of up to 2000cd/m2
- High Contrast Ratio of up to 2000:1
- Extended operating Temp -40°to 80°C
- Low Power Consumption
- Choice of yellow, green, blue, red or white on black background

TFT Displays

We offer a comprehensive selection of over 300 TFT display modules, designed for a wide range of applications. TFT LCD modules are available in both standard & customizable options, providing flexible solutions to meet diverse customer needs.

Control options include:

- TFT panels with controller boards
- IPS TFT
- High-brightness (sunlight-readable)
- Wide temperature
- Bar type TFT
- Monochrome TFT displays

A We also specialize in touch screen displays with resistive, capacitive, and touchless (hover touch) technologies, available in both landscape and portrait modes

Round TFT Display Modules

WINSTAR offers a comprehensive range of round TFT LCD display modules, available in sizes from 1.28" to 4", featuring advanced IPS wide viewing angle technology. With both capacitive touch and non-touch options, these round displays provide exceptional visual clarity and stability. The resolution ranges from 240x240 to 720x720 dots, making them suitable for a wide array of applications. These round TFT modules support multiple interfaces, including SPI, RGB, and MIPI, ensuring seamless integration into a variety of systems.

Applications

Our round TFT displays are highly versatile and can be used in diverse fields such as smart home devices, wearables, automation equipment, and precision instruments. Whether you're designing for coffee machines, air purifiers, smartwatches, or industrial control systems, these round LCD display modules deliver clear, vibrant, and reliable visuals to enhance your products.

Why Choose WINSTAR Round TFT Displays?

WINSTAR's round TFT LCD display modules offer exceptional versatility with high-resolution visuals, a range of interface options (SPI, RGB, MIPI), and the flexibility to fit into diverse applications. Engineered for performance and ease of integration, these round display modules bring your innovative designs to life. With WINSTAR, you get reliable quality, robust technical support, and the ability to customize displays to meet the unique needs of your projects.

Plus Opto is the authorised UK distributor for Winstar Display Corporation

Smart Displays

WINSTAR Smart Displays is an innovative display and offers shorter time to market and ease of implementation for a range of TFTs and OLED displays. The current range includes UART, CAN and RS485 protocols interface. Our abilities to mix-and-match different LCDs with our CAN platform are limitless. High brightness and wide-temperature options are available to support control applications in harsh operating conditions such as automotive, marine, power generation and oil-and-gas.

WINSTAR offers out-of-the-box "Smart Display solution" into our product lines to meet customers' unique applications and requirements. It will lower your development costs and speed your time-to-market expectations.

The "Smart Display solution" comes with WINSTAR standard display modules and UI objects to get customers project off the ground quickly. Our Smart Display solution is featured with:

Built in flash memory, store the font and Object Dictionary data.

Get started quickly, suitable for fast and easy integration of a HMI into any application.

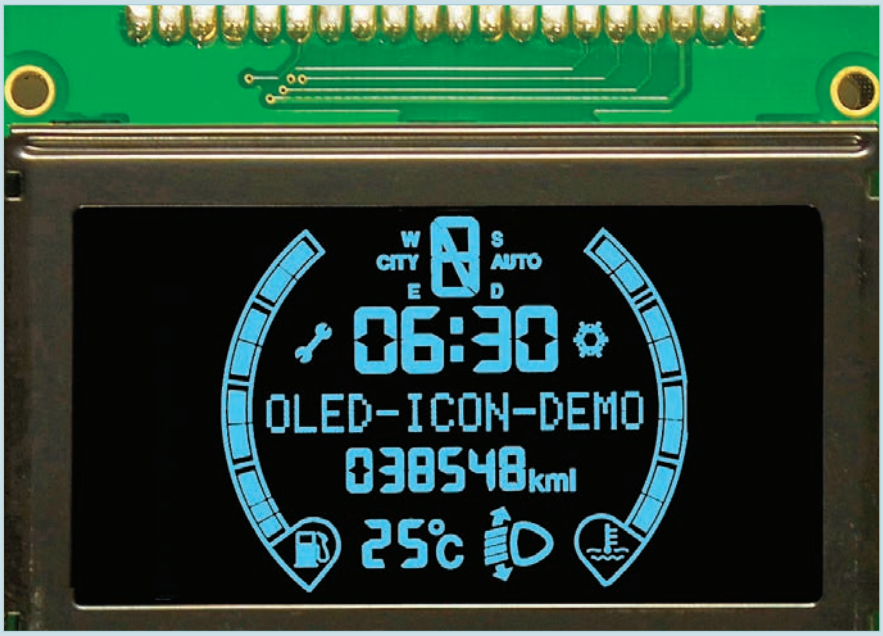
Design the UI without writing a line of code by WINSTAR GUI builder!

Designed with STM32F series MCU and Support STMicroelectronics'(ST) software development tools.

Supports QT, LVGL, and Embedded Wizard GUI frameworks for flexible HMI development.

We've also launched Entry Level UART TFT series in response to the increasing demand of UART interface. It's All-in-One module and featured with simple app "Clever system User API "to make your coding quicker and more efficient.

Our role in the custom design process is to advise and ensure that the manufacturer correctly understands & implements the requirements, using our experience & expertise in displays, to reduce the time taken to develop a cost-effective and attractive solution



Custom Displays

If a standard display doesn't meet the design criteria, we are able to assist with a bespoke solution. Whilst our range of off-the-shelf LCD modules is comprehensive, it may be that a special display is required, perhaps with symbols or text and a numerical layout designed for easier interface. Designers often find that a custom display improves product differentiation enabling the product to stand out against competitors.
The process begins with identifying the preferred dimensions and segment content. At an early stage we can advise on the most cost-effective overall size to ensure that the concept is commercially viable.

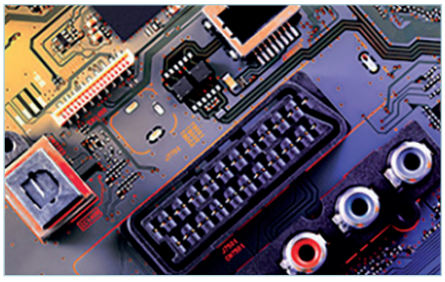
Custom Displays

We offer a bespoke design service for tailor made LCD/TFT/OLED display products. Our extensive portfolio makes it possible to create tailor-made solutions for customers to fit their application. We have the advanced display technologies available to use in your design and if there is anything you want to change about one of our existing LCD/TFT/OLED displays, we can make it happen. With more than 23 years' experience, our sales and engineering team will be with you through the entire development process and will ensure the semi or fully customization a successful display tailored made to the individual application.

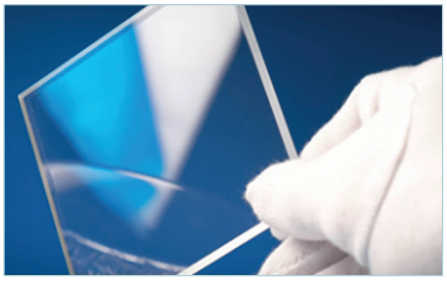
We can offer various options on backlight type, pin and connector, cable, resistive touch screen (RTP) and projected capacitive (PCAP) touch screen or anti-reflective or anti-glare coating, or custom cover lens, ZIF PPC or customized PCB board or a fully custom solution for your product application, as well as System Integrated Solution.

Display

Communication Interface



Surface Treatment



Manufacturing Solutions

Communication Interface

Surface Treatment

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