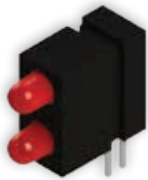




making light
work for you

MARL

PCB MOUNTED LEDs, BULB REPLACEMENT LEDs AND SEALED PANEL INDICATOR LEDs



PCB Mounted LEDs



Bulb Replacement LEDs



Sealed Panel Indicator LEDs

Based in the small market town of Ulverston, Cumbria in the UK, Marl has been adapting leading LED technology to provide innovative, attractive cost-effective solutions for over 40 years.

In the 1970s, Marl was one of the first companies to identify the demand for solutions-led applications, allowing the end user to maximise the potential benefits from this new LED lighting technology.

From this, Marl has created a core product range comprising of PCB mounting, Bulb Replacements and Sealed Panel Indicator LEDs, all utilising the best LED technology for customers and applications all over the world.

PCB Mounted LEDs were the first products that Marl manufactured in the 1970s, improving millions of Circuit Boards around the world with better status indication. Over the decades Marl has seen these products used as status indicators in a wide range of applications including telecoms equipment, computer IT systems and process control.

In the 1980s, Marl began manufacturing Bulb Replacement LEDs. As this product range has evolved, the capability to directly replace bulbs utilising conventional light source technology has grown enormously; in the beginning only offering low intensity colours, to today being confident that a Marl Bulb Replacement LED will be available as a standard or semi-custom part to suit virtually any application demanded.

Also in the 1980s Marl's range of Sealed Panel Indicator LEDs began to evolve; providing front-of-panel indication for a vast array of safety critical applications. Design engineers have been choosing Marl Sealed Panel Indicator LEDs to give end users clear visibility from the best single light source available.

DEFENCE ACCREDITATION

Defence manufacturers code: (Cage code) U3054

NATO stock number listings available

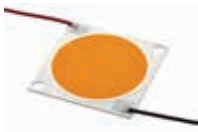
ECCN No: EAR-99

HTS Code No: 8541402000

"Our lighting industry customers are looking for the best LED technology for their application, fast response, and consistent high quality and support they can rely on through the total product life cycle at a cost which maintains their own competitive advantage; that's the Marl way of supporting the UK lighting industry!" **Adrian Rawlinson, Managing Director, Marl**

CHIP ON BOARD LEDS, LEDS ON BOARDS AND LED COMPONENTS AND ACCESSORIES

The Marl DNA is all about speed of innovation, and willingness to respond to changing needs as projects develop and mature throughout their entire life cycle. As LED devices become brighter and more efficient, Marl's product range has expanded to accommodate and compliment brand new technologies including the ever-evolving Citizen Chip-on-Board LEDs; which Marl is proud to offer as the brightest COBs in the world.



LEDS

- Lineup of x207 Citizen COB models that can be used in applications from bulbs to stadium lighting
- Luminous flux 24 lm to 57,463 lm (0.1W to 526W)
- SMT, 3mm, 5mm, LEDs and LED Light Pipe Assemblies



LED DRIVERS

- Suitable for driving Citizen COBs
- Wide range of input and output options
- UL Approval



OPTICS AND REFLECTORS

- Workable with or without COB LED connectors
- Available in many different dimensions



CONNECTORS AND LED HOLDERS

- Available for COB LEDs
- SMT on PCB options
- Compatible with optics and reflectors
- Aimed at industrial and commercial applications



HEAT MANAGEMENT

- Wide range of different thermal conductive options
- Heatsinks, silicone and grease options

WHAT OUR CUSTOMERS SAY...

"The light engines that @marlleds make for us are beating cheaper alternative LED output by 300 - 500% in our fixtures."

Budmaster LED Ltd@BudmasterLEDLtd

"The advice from The Marl Team and the service following has been brilliant."

Les Poole, Managing Director, M&P Survey Equipment Ltd

"Saving the world one lightbulb at a time! Thanks @MarlLEDs #ProudToBeBritish."

Paul Jones@pj201



SERVICES, CAPABILITIES AND THE SURFACE MOUNT TECHNOLOGY CENTRE

The Marl Design & Development Team consists of highly qualified multi-disciplinary engineers with a broad range of experience and expertise in optoelectronic, hardware, software and mechanical design with specialist knowledge in LED technology integration. Our team can support any custom design specific enquiry ranging from LED lighting systems (with access to the world's top LED manufacturers), on-board intelligent driver control, electronic circuit design, hardware and software development. With past experience in multi-industry specific designs ranging from the Lighting, Defence, Auto, Rail, Off-Shore, Commercial, Industrial and Signage markets; we can support any custom design requirements.

DESIGN, MANUFACTURE AND TEST

Services:

- PCB Assembly including surface mount and hand assembly
- Environmental testing facilities
- Fully equipped precision tool room
- Environmental test chamber
- PCB wave soldering
- Thermal imaging and modeling
- High voltage testing
- Dark room optical measurement facilities
- Global supply chain network for electromechanical and electronics including LED and SSL components and accessories
- Technology demonstration areas

Equipment List:

- Pacer Flat Bed CNC Router; materials up to 2.5m long and 1.25m wide; used for rapid prototyping
- Hurco VM20 CNC Milling Machine; 20 tools; bed size 1m x 0.5m
- Hurco TM6 CNC Lathe; 12 tools
- Citizen Sliding Head CNC Lathes; auto bar feed; diameter up to 25mm

EMA (ELECTRO-MECHANICAL ASSEMBLY)

Marl delivers a number of electro-mechanical assembly solutions. They are especially suited to meet Urgent Operational Requirements or to provide small and medium volume requirements for niche applications often demanding high standards of performance, ingress protection, reliability and overall ruggedisation. This capability includes full turnkey solutions with testing to client specification, packaging and a global distribution network.

SURFACE MOUNT TECHNOLOGY CENTRE

Marl is proud to present the SMT Centre. Marl's SMT and LED assembly facility is ideally suited to competitively support professional luminaire manufacturers who specialise in producing interior and exterior lighting, for example; sealed, linear and circular fittings utilising either COB or LOB technology.

