

BURNBRITE IS LEDI

PRODUCT BROCHURE

The Burn Brite IS LEDi provides standard white light and coloured light warnings, decreasing the risk of injury to personnel through autonomous machinery movements.

Designed specifically for use in underground coal mines, key components of the IS LEDi system are IECEx certified Ex ia for Group I applications.

The system comprises of three main components: The intrinsically safe light, a Bluetooth gateway device and an interface module.

Each light on the system is individually controlled through a Bluetooth wireless mesh enabling it to display 7 colour variations, a variety of flash sequences and brightness levels controlled by the mine automation system.

These colours and flash sequences can be used to create highlight visible warnings such as no go zones, indication of shield faults, positions of fire extinguishers and first aid stations.

Various information inputs from the mine wide SCADA system including PRS control commands, shearer and shield position, E-Stop status, gas detector readings, line pressures and fault conditions can be used to create warnings and scenarios.



FEATURES

- Automation control of lights – colour, intensity and flash
- BT mesh eliminates the need for control cabling
- Easy upgrade of existing installations
- Customisable fall-back settings in case of loss of communications or other fault
- Ease of setup with Web GUI
- Intrinsically Safe certification (IECE Ex ia Group I)

SYSTEM OVERVIEW

The first item in the system is the interface module (IXU) which is housed in the DCB or CME with ethernet access to the SCADA PLC or computer. The IXU takes data from the mine SCADA system and runs lighting scenarios.

Information including PRS control commands, shearer and shield position, E-stop status, gas detector readings, line pressures, fault conditions, etc., are used to create highly visible warnings. The IXU is programmed with information of each light, its ID and position on the longwall at time of commissioning.

The commands from the IXU are sent to the Bluetooth Gateway device (GXU). The intrinsically safe GXU is located near the AFC. Its role is to configure and manage the Bluetooth mesh and transmit the data to each light. The mesh is configured on power up and regularly monitored and re-configured as required. The GXU sends a signal through the mesh to each light with its colour and brightness information.

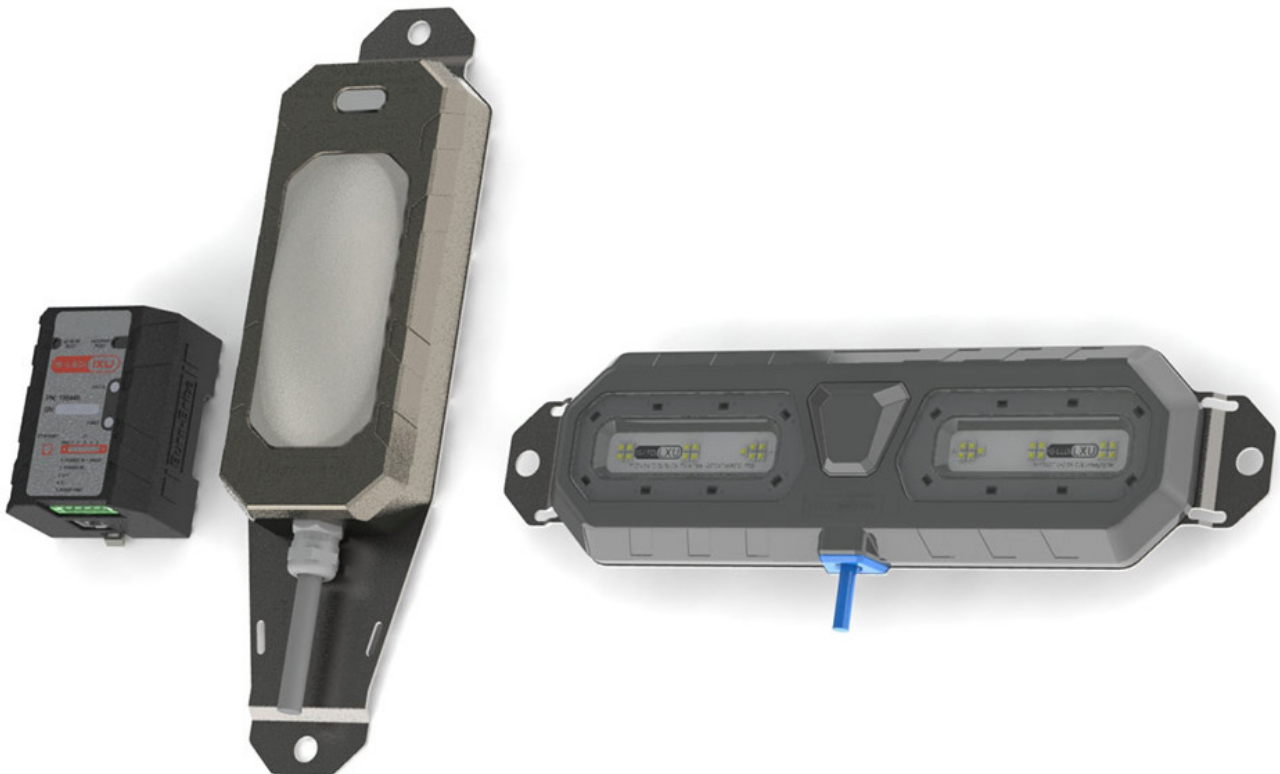
The IS LEDi lights (LXU) incorporate RGB and white LED chips, LED drivers and a Bluetooth receiver to produce red, green, blue, cyan, magenta, yellow and white and a variety of flash sequences and brightness levels.

Fed with 12V from our IS power supplies, the LXU consume the same power as the existing Burn Brite IS LED lights and produce up to 80 lux at 2m mounting height.

If colour is not to be controlled, the LXU do not need to be configured and can operate in default mode, with a default colour set before dispatch or on-site.

SYSTEM FEATURES

- Low current allowing for up to four lights per IS circuit, use of existing power supply groups possible
- Low profile light enclosure with same footprint and mounting points
- Up to 300 lights on each mesh, with multiple meshes possible
- LED chips produce up to 200Cd of white light
- Self-configuring Bluetooth mesh with dynamic updating
- System can be programmed with simple GUI on DCB mounted control screen
- New programmes can be loaded through webserver



IS LEDI LIGHT, LXU

The LXU is suitable for harsh industrial environments. The body is moulded in high impact strength, static dissipative nylon, and the clear lens is moulded in high strength polycarbonate.

Proprietary sealing and encapsulation provide IP66 ingress protection and thermal management.

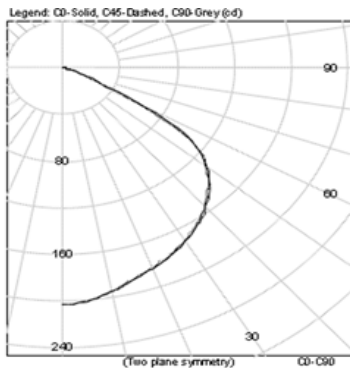
The light is 36x100x34mm. Mounting is by two 12mm holes at 320mm centres.

Each light is fitted with 0.5m 2 core 1.5mm² screened cable with an Amphenol 4 pin plug.

CERTIFICATION

- Certification Number: IECEx ExTC 20.0012X
- Complies with: IEC60079.0, IEC 60079.11
- Category: Ex ia I IP66

POLAR PLOT



IS LEDI LIGHT, LXU - SPECIFICATIONS

Electrical	
Light Source	LED
Voltage	10.5-13 VDC
Current	510mA
Power	6W
Operating temperature (Ta)	-20 to 40 °C
IS parameters	
Max input voltage Ui	13 VDC
Max input current Ii	2.5 ADC
Max internal capacitance Ci	Negligible uF
Max internal inductance Li	Negligible mH
Photometric (white only)	
Flux	520 lm
Intensity	215 Cd
Illuminance at 2m	53 Lux
Beam angle	125 Degree
Colour temperature	~5000 K
User Defined Defaults	
Available Colours	W RGB + Cyan Magenta Yellow
Power	20-100%, 10% increments
Flash rates (50% on/off cycle)	0.25, 0.5, 1, 2, 3, 4 & 5 secs
Mechanical	
IP rating (all surface)	IP 66
Size (L x W x H)	36 x 100 x 34 mm
Mass	1500g

BLUETOOTH GATEWAY, GXU

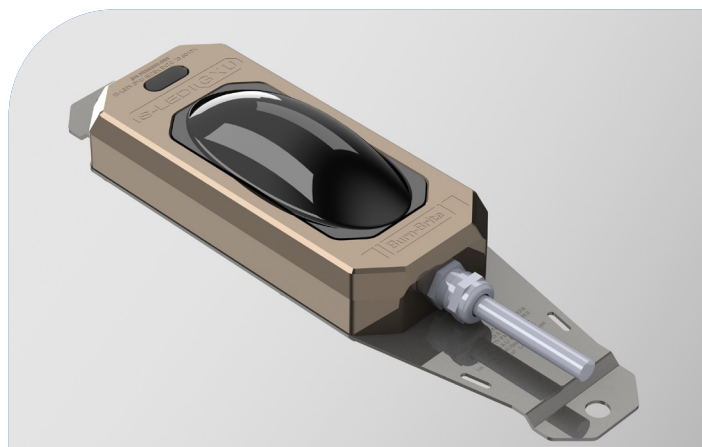
The GXU is the Bluetooth gateway for the IS-LEDi.

Using low energy Bluetooth 5 and Mesh technology, it provides cable free communication to the IS-LEDi LXU lights.

A robust RS485 network interface is used for communication to the IS-LEDi IXU and integration into automation control.

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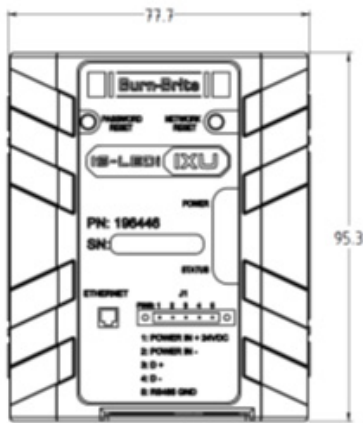
Electrical	
Voltage	10.5-13 VDC
Current	40mA
Power	< 0.5W
Operating temperature (Ta)	-20 to 40 °C
Bluetooth	5.0 BLE
IS parameters (input)	
Max input voltage Ui	13 VDC
Max input current Ii	25 ADC
Max internal capacitance Ci	Negligible uF
Max internal inductance Li	Negligible mH
Mechanical	
IP rating (all surface)	IP 66
Size (L x W x H)	360 x 99 x 57 mm
Mass	3500g
IS parameters (RS485)	
Max input voltage Ui	7.15 VDC
Max internal capacitance Ci	Negligible uF
Max internal inductance Li	Negligible mH
Max output voltage UO	4.935 V
Max output current IO	69.73 mA
Maximum output power PO	85.58 mW

HARDWARE INTERFACE UNIT, IXU

The hub of the system is the IXU, which receives commands from the host PLC, either EIP/CIP or MODBUS, and transmits translated RS485 instructions to the GXU for broadcast to the LXU using the Bluetooth mesh.

The IXU also provides a webserver interface to enable easy configuration of the system. Key points include mapping of individual light identity to its physical location, system diagnostics, light default settings in the absence of BT communication link and the saving of system settings back to local PC.

The IXU pcb is housed in a plastic enclosure and is intended to be DIN rail mounted.



The IXU is located in a safe-area. It is fed with 12/24VDC and an Ethernet connection to the PLC. Output to the Ex zone is via an IS barrier.

