

Lane Use Lamp Controller (LULC)



The Lane Use Lamp Controller was designed to provide safe signal display for the operation of lane use signals utilised where vehicle traffic direction is changed, that is, contraflow, tidal flow and reversible lane systems. The LULC card incorporates a firmware conflict monitor that immediately disables display operation if a 'back-to-back' green to green signal display state is detected. For added protection a failsafe relay circuit module may be added, which provides a green supply signal ON state only when the opposing red is active.

The signal lamp display state is enabled upon interpretation of an RS422/RS485 signal level serial communication message from a remote control facility, which designates required ON-OFF lamp states. This control process, is used to select a lamp drive signal output which controls either one or two sets of RED CROSS and GREEN ARROW signal lamps or a full aspect RED or GREEN display.

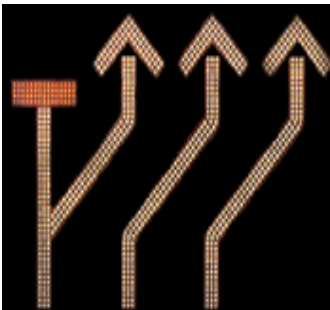
The LULC card is a single circuit control card located within a weatherproof enclosure mounted below the final signal assembly on a roadside pole. The card receives serial instructions from the local TMSO (Traffic Management System Outstation).

Options

- In the standard LANE USE configuration, signal states are set to ON – OFF from a remote control facility. Preset periods of signal state flash may be preset during transition periods
- In the ERDIS (En Route Driver Information Signal) program configuration, the yellow lanterns always flash when commanded to switch on and until commanded to switch off
- In the RAD (Roundabout Display) program configuration, the yellow is on until switched off. The devices can be commanded to turn on any combination of red and yellow aspects

Feature Attributes

- The standard circuit module has four lamp outputs and controls two RED / YELLOW signal aspects mounted back to back
- The LULC card is a single circuit control card that receives serial instructions from a remote source
- LULC cards can be multidropped on the RS485 network. A 'binary' address switch selects the specific card address. Two addresses should never be selected on the same RS485 multidrop line
- Firmware signal state conflict monitoring and optional RED – GREEN lamp interlocking
- Bulb state monitoring facilitates the reporting of lamp failures and activates redundancy lamp operation in critical applications
- A lamp flashing state is built-in to the display card and user configurable. The flashing rate duty cycle is typically 60% at a 1Hz cycle





General Specification

Physical

- Weight: < 0.4 Kg
- Operational Temperature: 65°C 90% humidity
- Circuit card size: 210 mm length x 155 mm width x 6 cm height (varies according number of lamps and lamp currents, that is, need for HEATSINKS)
- Circuit cards are conformal coated and will operate within Australian Standard Guidelines for Traffic Control Devices as per TSC/3 and TSC/4
- The conformal coating material has a dielectric strength of 90KV/mm and an operational temperature range of -70°C to 200°C and is self-extinguishing when exposed to a flame

Power Supply

- Current consumption card: 200 milliamps PLUS rated lamp current (ELV 3.5 amps)
- Operational voltage: single 240 volt AC supply or selected ELV supply voltage
- Voltage regulation and control is provided by onboard transformer and regulation

Connector Specification

- Easy to connect through PCB Modular Terminal 'Phoenix style' connectors, 10 amp rated voltage 300 volt AC
- Connectors allow disassembly without removing wiring

Digital I/O

- Dig-Output devices: PVAZ172 MOSFET Photovoltaic relay 60 volt 500 milliamp capability
- Dig-Inputs are optically isolated by PC844 Opto-isolator 5000 volt RMS isolation devices, input 20 milliamps at 1.2 volts
- The circuit operation is fully microprocessor operated – the circuit card range includes MICROCHIP Microprocessors including PIC 17C756 and PIC 16C74

Communications Interface

- RS422 dual pair differential communication interface (typical operation 1 Km)
- Optional galvanic isolation circuit module interface

Lamp Switching

- User selectable voltage operation – factory set and configured to user requirements
- 240 volt AC, 24 volt AC, 12 volt AC, and a range of ELV DC voltages
- AC Switch - TRIACs MAC210 / Typical load 1 amp at 240 volt AC *
- DC Switch - FET BUK543 / Typical load 4 amp at 12 volt DC *
- Basic heatsinking

Typical Communication Protocol

All command messages, so long as they are not broadcast, cause the device being addressed to respond. If a SET command is received correctly, an ACK message is replied. If the message was invalid a NACK message will be returned instead. No reply is sent for a broadcast message. For request messages, no ACK is sent. Rather, the requested data is returned instead.

For more information, sample software and diagnostic software please contact Excel Technology Group Pty Ltd.