

*High Technology  
Emergency Lighting*

## Mackwell Integrated Modules



Micro Integrated Module - for DEL compact lamps 18 & 26 watts

Mini Integrated Module - for compact lamps 9 - 38 watts

TwinStart® Integrated Module - for twin compact lamps 13, 18, 26 watts

UniStart™ Integrated Module - for single compact lamps 13, 18, 26 watts

T5 circular Lamps 22, 40, 55 and 60 watts, TEL lamps 13 - 42 watts

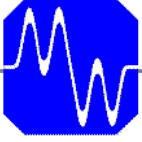
Q-Start™ Integrated Module – for T5 lamps 14 – 54 watts, TC-L lamp 55 w

8 watt Integrated Module - for 6 & 8 watt lamps

Open PCB Integrated Module - Smaller footprint than Mini Integrated Module

5 volt charger module for low wattage and voltage applications

Ballasts comply with EN 60 928



The Mackwell Integrated Modules are combined high frequency ballasts and emergency lighting unit complete and ready to fit into a luminaire. The high frequency ballast operates the lamp in both mains mode and emergency mode. They are easily fitted by 2 x M4 screws and are connected through normal push wire terminals.

The use of the latest Surface Mount Technology has enabled the original and highly successful Mackwell Integrated Module™ to be extended into a wide range, to enable the integrated approach to be used in a wider range of luminaires. Extra High Temperature batteries type VT137 should be used in any luminaire operating above 45°C, up to 55°C continuous. (For further information see Nickel Cadmium Batteries)

## Ballast Performance

The high frequency ballast in the Integrated Modules incorporate soft starting to maximise the lamp life, and automatic shutdown to prevent ballast failure when the lamp reaches end of life or is removed.

For Health & Safety reasons, removal or replacement of the lamp while powered up is not recommended, but will have no adverse effects. The replacement lamp will immediately operate without the ballast having to be reset. The ballast complies fully with EN 60 928, and operates the lamps at the powers indicated below. The ballast complies fully with EN 60 555-22 : 1987, with respect to harmonics, and have been approved by GE lighting for use with 2D lamps

## Voltage Sensing Circuit

The AC supply voltage is sensed so that switching occurs between 60% and 85% of the nominal mains supply voltage as required by EN 60598 for emergency lighting luminaires.

## Emergency Performance

The module section incorporated in the Integrated Modules comply fully with EN 60 924/925, and are KiteMarked.

The charging module incorporates deep discharge protection (DDP), to prevent damage to the batteries caused by deep discharge and possible subsequent reverse cell polarity. It will also allow testing of the luminaires without subsequently flattening the batteries.

## Sinusoidal Output

The output from all integrated modules is non-rectified sinusoidal, except D223 for 3 cell 28 watt, and DR227 for 4 cell 38 watt.