

## INSTALLATION INSTRUCTIONS

### AUTOTEST MODULE MAINTAINED

MODULES:	AS482 for 4 - 8 watt lamps and 2 cells AS483 for 6 - 8 watt lamps and 3 cells AS478 for 9 -16 watt lamps and 3 cells AS480 for 11 - 28 watt lamps and 4 cells AS484 for 18 - 36 watt lamps and 5 cells (non amalgam) AS540 for 18 - 40 watt TC-L lamps and 5 cells	High efficiency types (non amalgam) AS554 for 18 & 36 watt T8 lamps, 3 cells AS555 for 58 watt T8 lamps, 4 cells AS556 for 70 watt T8 lamps, 5 cells
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The above modules are for 3 hour duration with 4 Ah cells.

For 1 hour duration, add suffix /M1, and use 1.5 Ah cells.

### GENERAL DESCRIPTION

The module comprises battery charger, solid state circuit operating changeover relay and ballast disconnect switch, deep discharge protection circuit and LED charge indicator. A pre-programmed microprocessor system routinely tests all functions of the emergency circuits reporting status through the LED. The method of connection is by terminal block and a quick release mechanism is fitted so that leads may easily be removed. Wires of cross sectional area 0.5 – 2.5mm<sup>2</sup> may be connected by pushing a solid conductor into the connection or operating the release mechanism to insert a stranded conductor. The connection marked "starting aid" is fitted with a green/yellow lead with a ring which is intended to be bolted down by the nearest fixing screw to the chassis. The wire is not a safety earth, but is required to obtain EMC compliance or act as a starting aid for the lamp. PLEASE NOTE, THIS CONNECTION MUST BE REMOVED DURING FLASH TESTING. Earthing would normally be achieved via the fixing screws and the upper surface of the flange is unpainted to facilitate this.

### REMOTE MOUNTING OF MODULES

Modules may be operated in remote gearboxes providing the distance between module and gearbox is within 0.5M. Increasing distance will result in voltage attenuation at the high frequency used due to capacitive effects between wires and earth. This will impair lamp striking and running efficiency. **MINERAL INSULATED CABLES MUST NOT BE USED IN ANY CIRCUMSTANCE.** Multicore cables also have an inherently high capacitance between wires but may be used with caution providing the insulation is thick and opposite sides of the cable are used for opposite ends of the lamp to minimise losses.

### TEMPERATURE

The ambient temperature range for the module is 0 – 55°C but in any event the centre side of can should not exceed 60°C.

### BATTERIES

Mackwell supply a wide range of high quality battery packs for use with our products. They have all been designed to provide the 4 year life required by BS EN 60598-2-22 and ICEL 1001, when operated within the temperature range specified. The maximum operating temperature of Mackwell battery pack is detailed in our web site. This should not be exceeded, or the operational life of the cells will be reduced.

### DEEP DISCHARGE PROTECTION

The module is fitted with a deep discharge circuit, which disconnects the battery after the cell voltage has dropped below the end of discharge level (1 volt per cell) and the circuit will remain inert until the supply is restored. This will protect the battery against the dangers of full and deep discharge.

### FUSES

**Battery** A battery fuse is incorporated in the module to protect the battery from heavy discharge

**Charger** Although the charger is already short circuit protected it may be desirable for isolation to include a fuse in the circuit. A suitable value is 750mA or 1A.

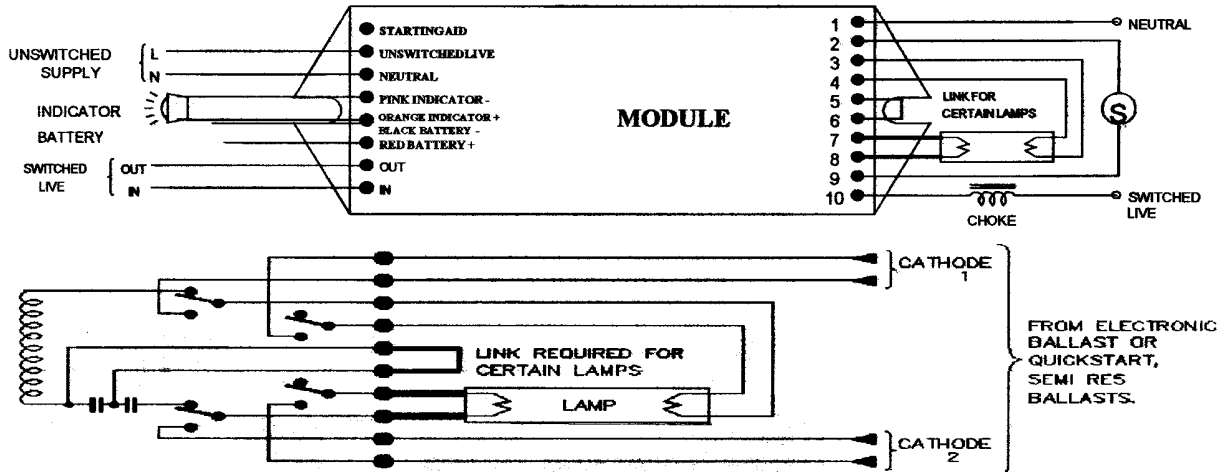
### ELECTRICAL INSTALLATION

All units have a 4 pole changeover relay, which fully isolates the mains control gear from the module inverter. In addition the ballast disconnect switch ensures that the switched live feed to the ballast is switched off whenever the module operates in emergency mode. These features ensure total compatibility with all high frequency ballasts and compliance with EMC directive. **Compliance of the luminaire will be dependent upon wiring arrangement.** The connection diagram below shows the RF



'hot' leads in bold lines and these wires should be kept as short as possible. To prevent false indication of a working lamp it is essential to **separate lamp lead pairs and route along non-parallel paths**. When electronic ballasts are being used where lead lengths are also critical, they should be wired on this side of the module. Lamp leads should be kept away from mains leads to avoid RFI transfer to the live and neutral connections. The fused terminal block should be situated so that the incoming mains leads are short. Module internal connections are shown dotted to illustrate the arrangement in the 'mains healthy' mode. To prevent premature lamp damage, after test the assembled luminaire should only be energised for a minimum of 24 hours to fully charge the batteries. The un-switched supply should be left undisturbed during the commissioning and installation period, as otherwise lamp damage may occur.

## WIRING - SWITCH START OPERATION



## OPERATION

The module routinely tests all functions of the emergency system and reports on status through the LED.

- A continuous green LED indicates**
    - mains present and connected
    - battery present and in circuit
    - charge current satisfactory
  - A flashing green LED indicates**
    - lamp fault
  - LED off indicates**
    - battery fault or lack of mains
- All fault indications persist until fault rectified and system reset.**

The autotest system goes into self test mode within a period of 37 days from commissioning. The test schedule is programmed into the microprocessor during manufacture to ensure that no more than 15% of luminaires are on test in any one day. Tests are repeated on a 30 day time frame. **Three test durations are provided - 5 minutes/monthly - 60 minutes/6 monthly - 3 hours/12 monthly.**

- User reset facility**
  - To reset the LED after the fault condition has been rectified, the user simply switches the unswitched supply OFF/ON/OFF/ON within 10 seconds either external to or within the luminaire
- Test report status**
  - After each monthly test the memory status is incremented by one. The current status is displayed by the LED each time the mains is turned on. After a delay of 30 seconds the LED extinguishes (in groups of three to facilitate counting) to indicate the number of the next test to be carried out on an annual basis. The count is reset back to one after each annual test. In this way, users can be assured that essential monthly and annual tests have been carried out and compile any supporting records they may require.
- Audible alarm**
  - An audible alarm will sound if a fault is found during a test. The alarm will sound 3 times every 35 minutes until the fault condition is rectified and the unit reset.

## WARRANTY

All our electronic products are guaranteed for three years to cover both faulty workmanship and materials. This "Return to Base" warranty requires that the product is used within the terms and conditions stated above and in our literature, and in particular, modules must be used with the correct or approved battery pack. Items should be carefully checked thermally so that the specified temperatures are not exceeded under any conditions. Do not insulation test this product. Products returned to us under warranty must be carriage paid. Mackwell Electronics accept no liability for costs incurred. This does not affect your statutory rights.

Battery packs are guaranteed for one year, but when operating within the temperature specified in our web site have a design life in excess of four years as required by BS EN 60598-2-22.