

## INTRODUCTION

The mini Opal is an attractively styled, 30 metre Passive Infrared (PIR) detector that works with GJD security lighting controllers. The mini Opal has additional advanced PIR features as follows:

- Sensor mounted white-light filter to stabilise detections on sunny days
- Dual tamper switches for cover and wall-mount tamper detection
- Zone blanking using vertical curtains and horizontal foil for precise area coverage
- $\pm 90^\circ$  horizontal and  $\pm 45^\circ$  vertical aim adjustment
- Conformally coated electronics for enhanced UV and moisture resilience
- Attractive, modern styling with a protective cover to disguise sensor direction

## WARNING

- **NYLON WASHERS PROVIDED MUST BE USED WITH SCREWS**
- **ENSURE CABLE ENTRY AND SCREW HOLES ARE SEALED WITH WATER BASED SEALANT**
- **DO NOT USE SILICONE BASED SEALANT**

## FIELD OF VIEW

The mini Opal has 10 Fresnel lenses that focus areas onto the receptor. The 10 lens areas give 10 fields of view as follows: 5 long-range (lenses 0 to 4) and 5 medium- to short range (lenses 5 to 9). Movement between fields produces a stronger response than movement towards or away from the sensor in the same field. The 10 lenses monitor the area in front of the sensor as shown in the figure..

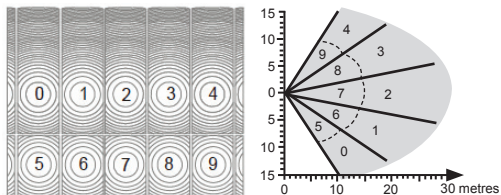


Figure 1: Diagram showing the 10 lenses and their views.

## EXAMPLE CONFIGURATIONS

The following shows four example combinations of angle and blanking settings:

### Optimum Height

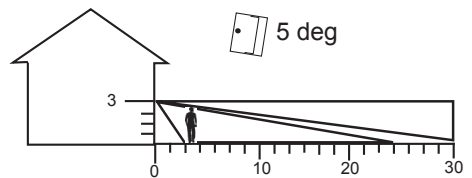


Figure 2: Sensor 3m high, 5 degree tilt, 30m range

### 6 Metres

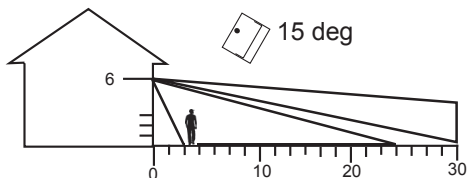


Figure 3: Sensor 6m high, 15 degree tilt, 30m range

### Pet Immunity (lower lenses blanked)

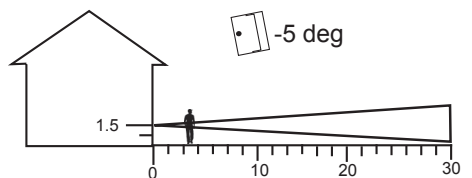


Figure 4: Sensor 1.5m high, -5 degree tilt, 30m range

### Curtain Coverage (upper lenses blanked)

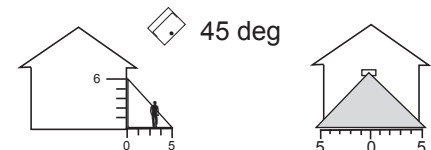


Figure 5: Sensor 6m high, 45 degree tilt, 5m range

## INSTALL

**Caution:** To avoid damage to your unit or incorrect fitting, take account of the following cautions:

1. The mini Opal is design for mounting vertically on a flat surface. Do not mount it on the underside of a roof edge because the sensor cannot be angled correctly in this orientation.
2. The range and focus of the mini Opal can be affected by grease on the lens or sensor. Always hold the lens by the edges and do not touch the sensor. If touched, clean with an appropriate soft, lint-free cloth.
3. Do not install your mini Opal outside during wet conditions such as rain or mist. Moisture inside the case can cause faults. The moisture will remain in the air-tight enclosure indefinitely.

## MOUNT

1. Choose a mounting position, it should:
  - Be 60cm (2ft) from lamps
  - If possible, allow the wiring to be run through the wall
  - Be smooth enough to hold the tamper plate in position and provide a good seal against the expanded foam back plate
  - Make allowance for obstacles that may cause a varying thermal image. For example, trees or shrubs in a wind, ripples on ponds (or large puddles), boiler flues and animals
2. **Remove the cover**
3. To reveal the two cable access, unscrew the top, plastic wing-nut and, remove the circuit board and lens unit.
4. The cable entry holes are protected by two sealed grommets. Use a screwdriver to punch out the centre of the grommets you intend using.
5. Hold the unit to the mounting surface and mark the location of mounting and cabling holes.

**WARNING:** To prevent damage to the unit, do not drill through the holes in the back of the case.

Always make the appropriate checks to ensure that the surface you are drilling does not contain mains electrical wiring or plumbing. Failure to do so can result in injury or death by electric shock.

6. Feed the cable(s) through the grommet(s) and fix the unit in your chosen location using appropriate fixings.

**CONNECT:** To prevent damage to your mini Opal or lighting controller, switch off the power before making connections

1. Connect the +, A, S and wires to the screw-terminal block on the back of the sensor PCB.

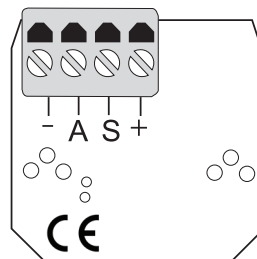


Figure 6: Rear of PCB with Connections

2. Optionally connect the tamper output on the top PCB to your alarm system.

**NOTE:** The twin tamper switches provide a single volts-free, normally-closed alarm output once the mini Opal is mounted to the wall and the cover is fitted.

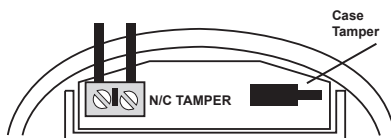


Figure 7: mini Opal tamper board

3. If required, see **Connect External Buzzer or Relay** (on Page 2/3)

When the power is applied, the red LED flashes for 0.6 seconds before stopping. The LED is normally off during operation.

### CONNECT EXTERNAL BUZZER OR RELAY

The unit can drive an external relay output or a piezo buzzer. The component specifications for the diagrams are:

- Diodes: 1N4148 / 1N4002 or similar - observe the band when connecting
- External relay: 12V DC, 470ohm minimum coil resistance
- Piezo buzzer: 12 V DC, 3mA, 80dB (A) at one metre

### Energizing a relay from the A or S connections

When the external relay is connected to the A connection, it will trigger for every detection and deactivate immediately. By connecting the relay to the S connection, the external relay stays active from 60s following the last detection.

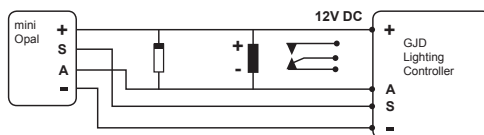


Figure 8: External relay wiring diagram

DRIVING A PIEZO BUZZER FROM THE A CONNECTION

This configuration can be useful as a temporary measure during your walk-test. The piezo buzzer will sound every time a detection takes place.

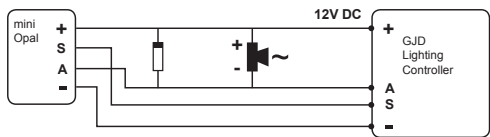


Figure 9: Piezo buzzer wiring diagram

WALK TEST

The walk test iterates through the following adjustments until the correct area is covered.

TIP: The field of view of the mini Opal is affected by the cover. Always perform the walk test with the cover fitted removing the cover each time you need to make adjustments.

- 1. Adjust the aim of the sensor, loosen the top and side plastic wing-nuts and swivel the bracket. Tighten the wing-nuts again and replace the cover.
- 2. Configure the field of view by blanking lens area as necessary. You may want to blank parts of the field using the vertical curtains or by cutting the foil sticker to size. Apply the sticker to smooth, rear side of the lens.
- 3. Adjust the range between 8 and 30 metres using the PCB mounted pot.

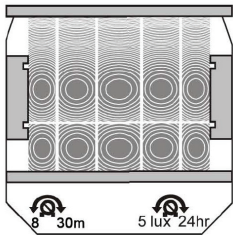


Figure 10: Range and lux potentiometers

DUSK ADJUSTMENT

Adjust the lux level for the day-night setting using the lux PCB mounted pot.

The S output is factory set to start operating at dusk. That is, when the light level falls below 5 lux. If the ambient night-time light levels are higher than 5 lux then the S output will remain inactive and your lights will not turn on.

- If the light level in your installation is about 5 lux at night (lights do not operate), increase the light level at which the S output starts to operate, by turning the lux pot clockwise towards 24HR.
- To set the S output to detect continuously, day or night, independent of light level, turn the lux pot all the way to maximum, marked 24HR.

SPECIFICATIONS

Coverage (max)	90° at 30m, equivalent to 625m²
Range	Adjustable 8m to 30m
Directional adjustment	±90° horizontal (180°), ±45° vertical
Area adjustment (blanking)	Supplied with, 1 foil label for near/far beam blanking and 4 vertical opaque curtains for zone blanking
Lens	2 rows of 10 beams
Sensor	White light filter prevents false triggering when sunny
Ouput A (Alarm)	Open-collector transistor switch. 12V, 25mA alarm current.
Output S (Sensor, daylight)	Open-collector transistor switch, 12V, 25mA alarm current
Output T (Tamper)	Volts-free, normally-open switch output
Tamper switches	Case open and removal from wall
Power	9 to 15V DC
Current	4mA at 12V
Operating Temperature	-20°C to +55°C
Protection	IP55, high-impact ABS housing, Conformal coated electronics (moisture and UV protection lacquer)
Dimensions	84 x 106 x 72 mm
Mounting	Suggested height 3m
Cabling	0 to 200mm: standard, 4-core, 7.0.2mm alarm cable 200 to 500m: 8-core, 16/0.2mm (use double cores)

APPROVALS

The manufacturer declares that the product supplied is compliant with the provisions of the EMC Directive 89/336/EEC amended 92/31/EEC for Electromagnetic Compatibility, and the Restriction of Hazardous Substances Directive (RoHS) 2002/95/EC. A Declaration of Conformity in accordance with the above directives is held on file with the manufacturer.

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# ENGINEER NOTES

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