

OUTDOOR LIGHTING

SKILL LEVEL



Basic DIY skills are needed to install new lights and wiring. Connecting things up takes electrical skills and technical knowledge, so if in doubt, employ an electrician.

SAFETY FIRST

Always ensure that the power supply is switched off before starting any work on your home's lighting circuits. It is not sufficient to turn off individual light switches. These instructions comply with the requirements of the current IEE wiring regulations.

INTRODUCTION

Adding outdoor lights will show you and your visitors the way to the front door on dark nights, highlight your garden and help to deter intruders.

A light by your front door is useful, so that visitors can find it after dark and you can identify them easily. Other lights can be used to illuminate side passages, and paths to the garage and back of the house. All can be wired up as extensions of the house wiring.

If you want to install lights some distance from the house, you must use a separate circuit. You can easily install low-voltage garden lights yourself.

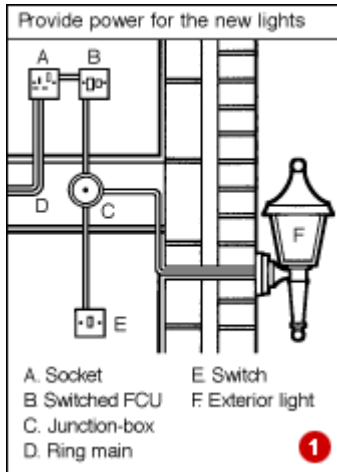
2 - Planning the job

Think about what lighting effect you want to achieve, as this will influence the types of fitting you buy and where you install them.

At the front door, and on the patio, you will probably want a decorative fitting (or two) that looks attractive by day and by night. The style is a matter of personal taste, and there is a wide range to choose from.

Elsewhere, function will be more important than looks. For example, cheap bulkhead fittings are ideal for side paths, garage approaches and so on. The one type of fitting to avoid, unless very high levels of illumination are absolutely essential for security purposes, is the 500-watt floodlight mounted high on your house wall. It is far too powerful for most domestic settings, and its glare merely annoys neighbours and passers-by.

Should you still wish to install floodlights, look for models that help combat light pollution.



Then decide how to provide power for the new lights. The easiest option is to take fused spurs from power circuits, since you can connect the spur into a socket outlet on or near an outside wall and take it straight through the wall to the light position (1).

You can connect the spur cable into any socket outlet that is on the main circuit and is not itself supplying a spur - in other words, one with two cables present. You cannot

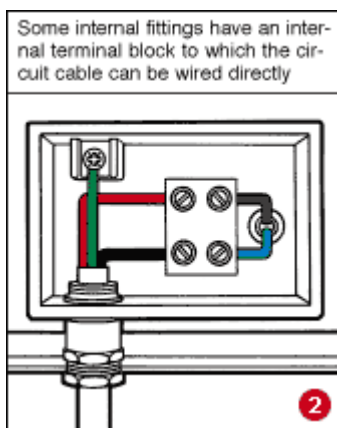
connect it to an outlet that is itself a spur, with just one cable supplying it.

If you decide to extend an existing lighting circuit, use the upstairs one which you can access in the loft. You can then drop cables down the outside walls to the light positions. You would have to lift carpets and floorboards to get at the downstairs lighting circuit - a degree of disruption that may not be worth the effort.

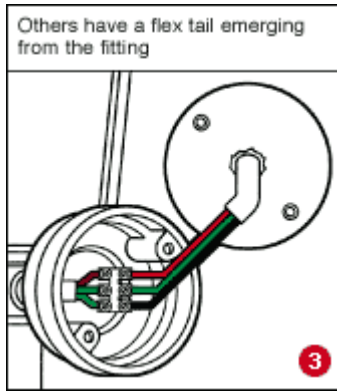
Check that extra lights will not overload a lighting circuit. Each can supply a maximum of 1200 watts. A high-wattage floodlight could easily cause an overload and blow fuses.

3 - Choosing fittings

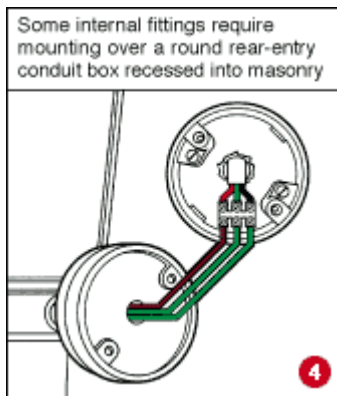
Any light fitting for outdoor use - even in a porch - must be marked as suitable for the purpose.



Inspect fittings before you buy, to see how they are intended to be connected to the circuit wiring. Some have an internal terminal block to which the circuit cable can be wired directly (2).



Others have a flex tail emerging from the fitting; look for ones with a hollow baseplate which can be used to accommodate the wiring connections (3). Both of these fitting types can be mounted straight onto the house wall, with the cable entering via a hole in the wall behind.



Other fittings require mounting over a round rear-entry conduit box recessed into the masonry (4) - a job best avoided if possible.

Decide how the lights are to be controlled. A porch light can be switched from the hallway, and patio lights from close by the back door. Other lights, with more of a security function, will benefit from passive infra-red (PIR)

control, although isolation switches must still be fitted.

A PIR detector senses the movement of any warm object - visitor, burglar, animal, car - moving in its field of view, and acts to switch on the lighting it controls. You can buy individual light fittings with an integral PIR detector, or have a separate stand-alone detector linked to a number of ordinary light fittings.

Choose the bulb wattage to suit the situation, bearing in mind the maximum wattage for the fitting. A 40-watt or 60-watt bulb will be more than adequate in most situations. Wherever possible, use compact fluorescent lamps rather than tungsten-filament bulbs for long life and economy.

4 - Preparing the cable route

Once you have decided where each light fitting is to be installed, the next step is to create a route for the spur cable. Ideally the cable should emerge immediately behind the fitting's baseplate, but if this isn't possible, the cable can run up or down the outside wall of the house.

When using tools, ensure the relevant safety equipment is used.

Check walls for buried cables and pipes before drilling. Special detectors are available to assist with this.

Use a 16mm diameter masonry drill bit to make a hole for each cable. It must be long enough - 400mm (16in) at least - to penetrate the wall in one go. Work from the outside so you can drill through a soft mortar joint rather than through the face of the bricks, and angle the drill bit very slightly upwards so rainwater will not penetrate the hole.

If you need a recessed conduit box to contain the connections to the light fitting, chop out its recess next. First remove a knockout and hold the box over the drilled hole. Mark its outline on the wall and drill a series of closely-spaced holes within it to a little more than the box depth. Then chop out the honeycombed brick with a cold chisel, clean up the hole and secure the box in the hole with screws and wallplugs.

Slide a length of 16mm PVC conduit through the hole to line it so the cable cannot chafe on the masonry. Then feed in the 1mm² cable, leaving about 150mm on the outside ready for connection to the light fitting. Indoors, route the cable to near the point you have chosen for the connection to the indoor power circuit. You can clip it to the top of skirting boards, or run it in mini-trunking if you prefer to conceal it.

5 - Installing the light fitting

At the light position, strip the cable sheath and the core insulation and connect the cable to the light fitting. If it has a terminal block (see illustration (2) in the section 'Choosing fittings'), you will probably need to feed the cable through a flexible waterproof seal at the cable entry point. Connect the cores to their terminals, which are generally marked L (live), N (neutral) and E (earth).

If the fitting has a flex tail, link this to the circuit cable, using three strip connectors. Link the cable red core to the flex brown core, the cable black core to the flex blue core and the cable earth core (covered in green/ yellow PVC sleeving) to the flex earth core, if it has one (see illustration (3) in the section 'Choosing fittings'). If it doesn't, simply link the cable earth core to the third strip connector.

If the fitting has a hollow baseplate, fold the cable neatly into it so it contains the strip connectors within it. Then fill the baseplate with clear silicone mastic to waterproof the connections. Use the same technique if the strip connectors are housed in a recessed conduit box.

You can now fix the fitting to the house wall. In most cases,

this involves marking the screw-fixing positions on the wall, drilling holes, inserting wallplugs and holding the fitting in place while you drive in the screws.

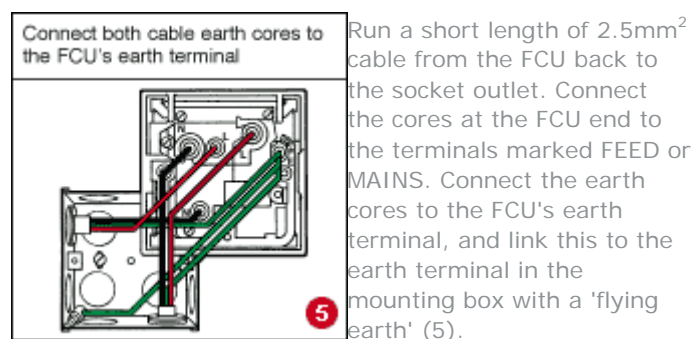
Some outside light fittings have a separate baseplate which you screw to the wall. The body of the fitting is then attached to the baseplate with machine screws.

With the fitting securely in place, run a bead of clear silicone mastic all round it to waterproof the junction between fitting and wall.

6 - Making the wiring connection

A spur to a light on the house wall must be fused, so the spur cable is run via a switched fused connection unit (FCU). This also allows the light to be isolated from the mains for maintenance or repairs. A 3amp fuse must be fitted in the spur.

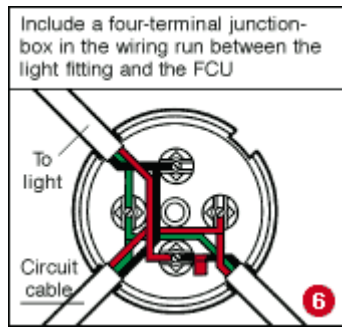
Install the mounting box for the FCU near to the socket outlet you have selected for the connection to the power circuit. Connect in the 1mm² spur cable from the outside light, and connect its live and neutral cores to the FCU terminals marked LOAD.



Turn the power off at the mains, remove the faceplate and feed the other end of the 2.5mm² cable into the socket outlet's mounting box. Strip the sheath and core insulation and connect the cores to the outlet's live, neutral and earth terminals, linking like cores to like. Fit a 5amp fuse in the FCU's fuseholder.

Restore the power and switch on the FCU, which will act as the light's on-off switch if it is an ordinary fitting. If it is PIR-controlled, leave the FCU switched on permanently; the PIR detector will act as the on-off switch.

7 - Providing separate switching



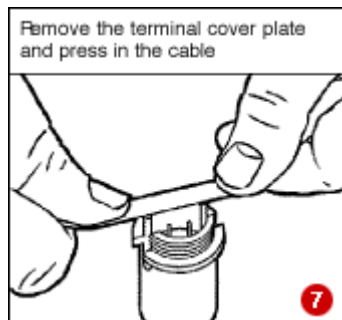
If you want the light to be independently switched, include a four-terminal junction box in the wiring run between the light fitting and the FCU. Wire in the switch cable there (6) and run it to your chosen switch position.

You can control the light from two positions if you create a two-way switching arrangement. For example, this could allow you to switch the light on and off from upstairs after bedtime - a useful security measure.

8 - Installing low-voltage lighting

The simplest way of lighting up your patio or garden safely is to use low-voltage light fittings powered by a transformer. You can buy complete sets consisting of a number of light fittings, special low-voltage cable (typically about 8m (26ft) long) and the transformer, which must be sited in the house, in an outbuilding or in a weatherproof enclosure.

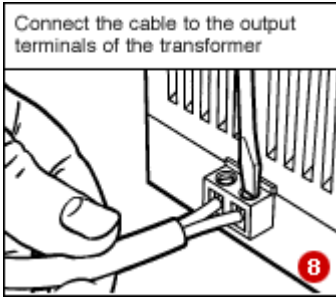
Decide where you want the lights, and lay out the cable from the furthest light position back to where the transformer will be placed.



Assemble the light fittings and place them next to the cable where you want to connect them. Remove the terminal cover plate from each fitting in turn and press in the cable (7). Pins inside the terminals pierce the two-core cable and make the electrical connections.

As all manufacturers' products are different, instructions supplied with light fittings must be followed.

Replace the terminal covers and set the fittings in position by pushing their spikes into the ground. The lamps can now be pushed into lamp holders.



Connect the cable to the output terminals of the transformer (8). Plug the transformer into a switched socket outlet, which will also act as the lights' on-off switch. If the transformer is in an outbuilding or a weatherproof enclosure, the socket outlet supplying it

must be protected by a high-sensitivity (30 milliamp) residual current device - the type normally installed for supplying garden power tools.