

Part 10: Connecting to the house

1st class cabin

It's been a painstaking installation and now's the time to make the final connection and test the new wiring.
By **Jim Watney**

Now the workshop is fully wired the connection can be made to the house but only when the installation has been inspected and tested and the house end of the circuit has been fitted. If you have any doubts about carrying out this section of the work, call in a qualified electrician. The installation must be safe and conform to the current wiring regulations before it is connected to the electricity supply.

Correct labelling

Labelling of the wiring is most important and must be observed. All earth connections must be labelled with an earth safety connection label. The consumer unit should have its MCB's clearly identified. In our case that would be 'Power sockets' and 'Lighting'. The weatherproof boxes will need two stickers, one reading 'Danger 230 volts' and the other reading 'Isolate elsewhere before opening this cover'. The inside of covers should be labelled and dated stating the purpose of the connections. This will help the next person to open the box to change or repair anything. The little Dymo printers are ideal for this job, or a label can be run off on the



The connection to the workshop is made on the outside of the building and is housed in a weatherproof box which is labelled appropriately

computer. Whatever way you do it, make it brief, ten words maximum, otherwise it will not be read.

At the house

In our case, we have a dedicated supply, running from the non-RCD protected side of the consumer unit, which is terminated into a small weatherproof box, mounted on the outside wall of the new extension. This supply was laid in during the building work and no provision for internal isolation was made at the time. An external switch could be added but that is inconvenient to say the least.

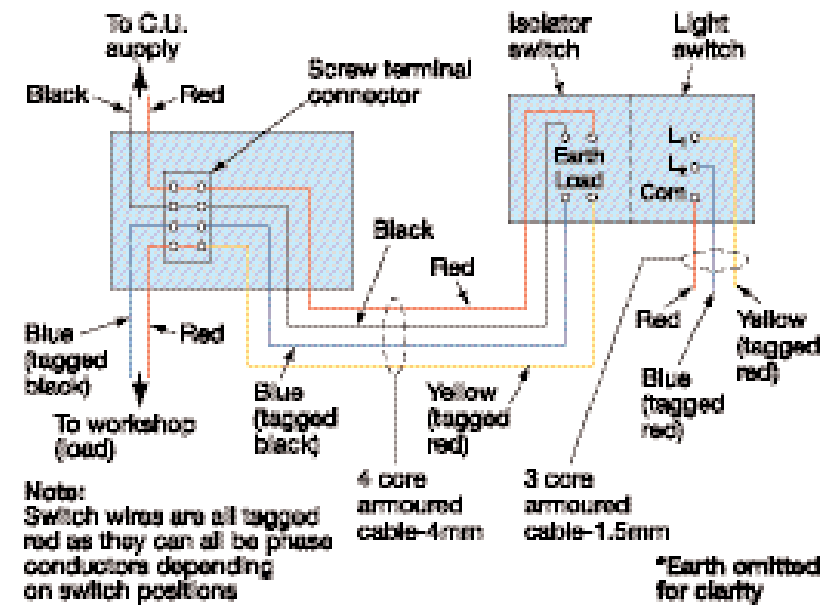
This supply is not protected by an RCD and must not be connected to any outlet that can be reached from outside of the house. The supply cable must be connected directly to the workshop's consumer unit, which incorporates an RCD independent of the house protection. This does mean that any faults that occur in the workshop will not trip the RCD in the house. It may be tempting to install a socket to this line to supply power to the patio, but don't. It will not comply with the regulations and is potentially dangerous.

If you do want to supply power to the outside, it is a fairly easy job to run a spur from a protected socket, on the inside of an outside wall, and connect it to an outside weatherproof socket. All sockets that can be reasonably accessed from the outside should be protected by an RCD. This is not always the case and if you are in any doubt, get it checked.

We also have to install the other end of the lighting circuit for the two-way switching of the floodlighting. This is to be done on the inside wall by the back door. By installing a dual surface box (not to be confused with a twin box) two single switch plates can be installed to a single box making a much neater job.

The armoured cable from the workshop is terminated at a waterproof box. We upgraded the small existing box to a slightly larger version. Here it is connected to the supply via the internal

At the house end the connection is made in another weatherproof box. The armoured protective sheath is earthed to the main earth terminal at the consumer unit using a 6mm earth cable. This must be the same size as the phase conductor used to connect the consumer unit to the junction box to comply with the wiring regulations



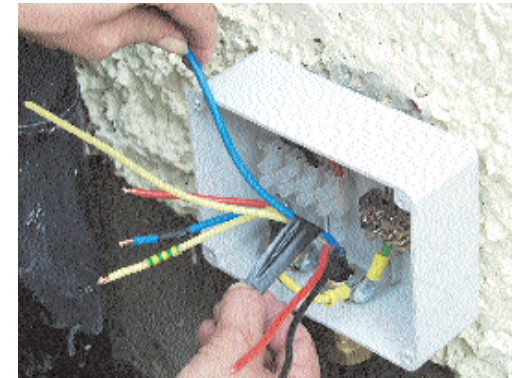
double pole wall switch. In order to avoid disturbing the newly decorated extension, armoured cable is run around the patio under the patio edging and up the wall to a conduit box positioned directly behind the internal switch box. A hole is drilled straight through the wall and lined with a piece of conduit which is connected to the two boxes with plastic female adaptors.

Making the connections

First of all, safety first. Use a voltage detector to check that the point of connection is actually live. Then:

TURN THE POWER OFF, USING THE MAIN SWITCH AT THE CONSUMER UNIT, AND PUT A NOTE ON IT THAT READS: 'DO NOT TURN ON: WORKING ON CIRCUITS'

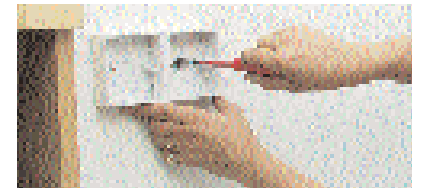
Wiring the box. The wires are 'flagged' with insulation tape to indicate their status (see diagram)



Secure the box lid. Note the stickers



The switch and two-way lighting cables are terminated in an adaptable box. In a confined space it's much easier to fit the gland kits and armoured cables to the box before securing the box to the wall



The dual box fitted to the wall inside the house. This is not to be confused with a twin box that is normally used for twin socket outlets

Then use the voltage detector to confirm that the power is off. There maybe another consumer unit feeding that section that you are not aware of. This is quite common in larger properties or older installations. Always assume a circuit is live until it is tested.

The armour sheath of the switch cable is connected directly to the conduit box with an external gland kit. The conductors are connected to

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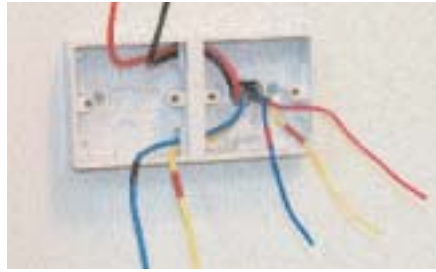
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The two sections of cabling are passed through the wall and are flagged to denote their status. The switch wires are flagged red (phase) because, depending on the switch positions, any of the wires can be a phase conductor



The dual box will accept two single switch plates. Neater than using two separate boxes and more convenient when bringing cable through a wall

the switch plate as follows: red to COM, yellow (flagged red) to L1 and blue (also flagged red) to L2.

Connect the four core armoured cable to the box as for the lighting cable and connect the conductors as follows: Red to 'Supply L', Black to 'Supply N' Blue



It is a requirement of the regulations that all work is inspected and tested. Some testing is done prior to connection. Here a simple plug-in tester is used to check that the connection to the sockets is correct

(flagged black) to 'Load N' and yellow (flagged red) to 'Load L'.

Fit the face plates to the wall boxes and secure the armoured cable to the wall using the correct cable clips.

Now return to the main box on the outside of the house. The armoured cable from the workshop is connected to the box using a weatherproof gland kit. Inside the box an earth block and a strip connector are secured to the back of the box. The earth cable from the main terminal block at the consumer unit is connected to the earthing point. The incoming phase and neutral are connected to the terminal block and if there is a bare CPC (Circuit Protective Conductor - earth wire) insulate it with a green/yellow sleeve and connect it to the earthing block

as well. All the armour protecting the cables is bonded together using the banjo clips supplied in the gland kit and connected in turn to the earth block.

The armoured cable's conductors need flagging to correct the colouring. The three core from the workshop needs the blue flagged black and the yellow flagged green/yellow, the red is left as it is the correct colour. The cable going and returning from the switch has four cores. The red and black are okay as they are. The blue needs to be flagged black and the yellow flagged red, as at the switch end. Make the connections as in the diagram. Turn on, and complete the final checks as shown.

The trip speed of the RCD is measured. Test equipment is expensive, you must be trained to use it properly and it must be calibrated annually

