



SMART 08

Introduction to Remote Controlled Switch Sockets

Preventing injury by using a remote control for convenient control of lights and other devices

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Warsaw University
of Technology



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SMART

MODULE 8

Introduction to remote controlled switch sockets

This module provides an overview of basic off-the-shelf home switch sockets that can be switched on and off using a remote control. This is a low tech solution, but is a smart creative strategy that can be easily and cheaply implemented in most existing dwellings. The main emphasis is to explain smart switch sockets that come out of a set package and not the more technical units using network routers and IP configurations.



Intended Audience

Setting up remote controlled electrical switches or sockets sounds complicated – but actually this job is usually quite simple.

This module is aimed at those who are reasonably comfortable with using technology to make homes age-friendly, but as we shall see, apart from really advanced systems that are mentioned at the end of this module, you don't need to be a tech expert or electrician to set up or use these devices.

For most devices of this type, you simply buy the device, plug it in, and then use the remote control to switch a light on or off.

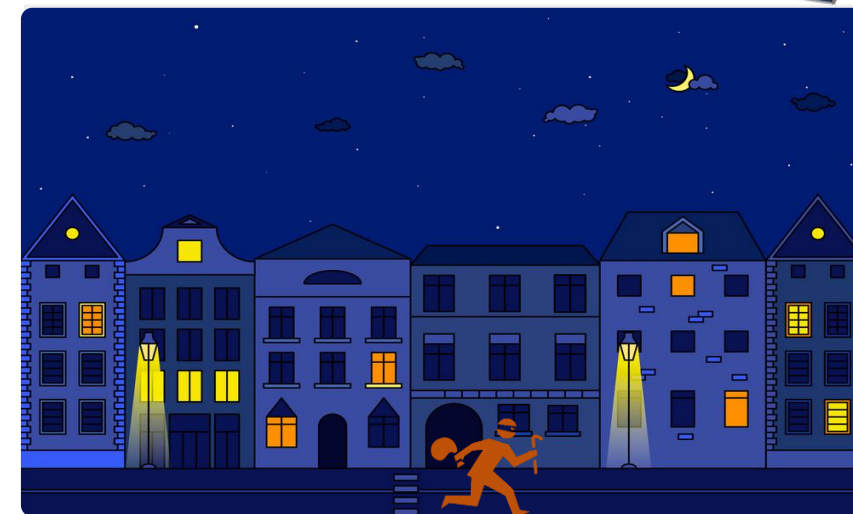


Introduction

As we age, it can be increasingly difficult to plug in lights and other electrical appliance, with the result we have a higher chance of falling and becoming injured.

Burglary and crime statistics show that well lit homes are less likely to be burgled than homes with poor lighting. This module shows how a remote control like the one you use with a television can switch electrical devices such as lights and other household appliances without risk of injury from reaching to plug or unplug.

This simple life hack can increase our visual security, as well as making life easier around our homes as we age in place.



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What will you learn

- 1 Differences between pre-configured remote controlled switched sockets and controlled sockets that form part of an installation.
- 2 Demonstrate simple uses where the remote controlled switch socket could be used to enhance independent living.
- 3 Discuss options that can be included with some of the set packages, for example PIR or light sensing.
- 4 Explain the difference between infrared and radio type remote systems and the issues regarding line of sight to the location of the switched socket.
- 5 Describe the maximum current rating of switched sockets.
- 6 Aspects of safety and security relating to good lighting practice.



Chapters in this module

1

Remote controlled switched sockets for independent living.

2

Remote controlled switching sockets – buying options.

3

Socket and plug safety – is there too much current?

4

Pre-configured versus installed remote controlled sockets.



SMART

MODULE 8

CHAPTER 1

Remote controlled switch sockets for independent living

Before looking into some of the detail about remote controlled socket switching, it is worth having a quick look at some ways in which remote controlled sockets can help to support ageing in place. This chapter provides a number of typical examples. Can you think of ways that this life hack would work for you?

What will you learn in this chapter

- 1 Uses of a remote controlled switching socket
- 2 Similarity between remote controlled switching sockets and a remote controlled air conditioning system.
- 3 Better control of lighting improves security in the home

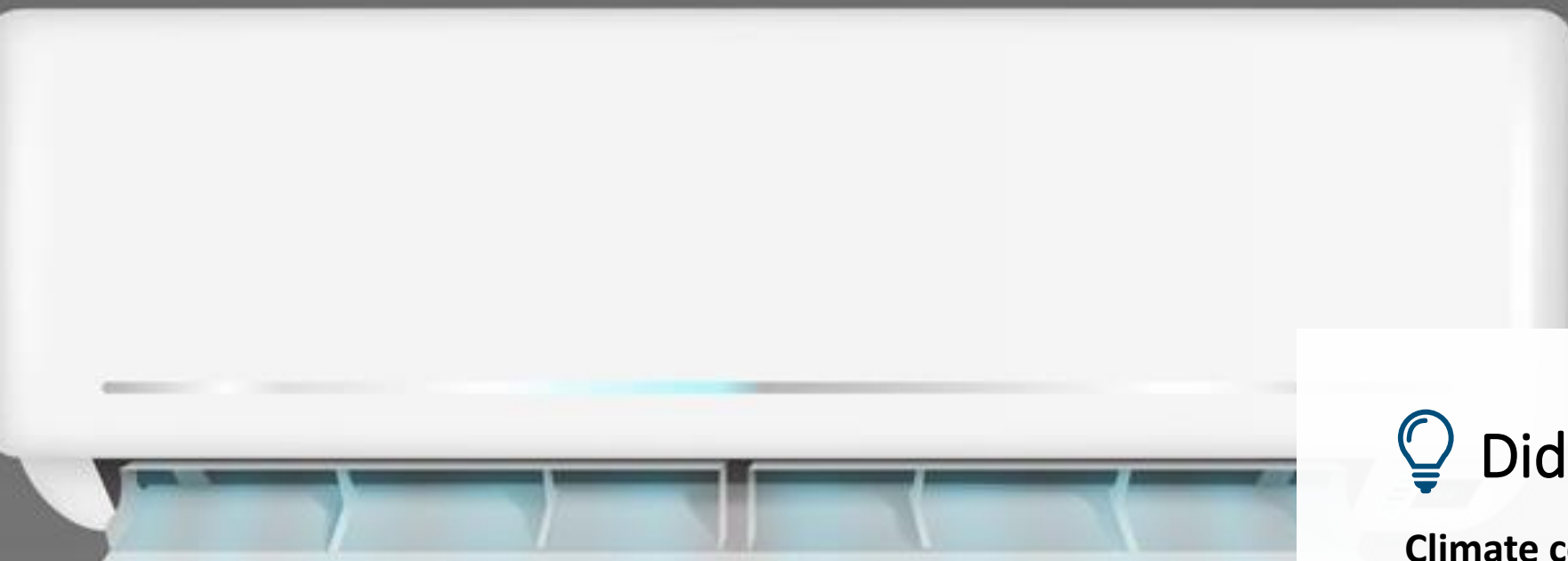


What is a remote controlled socket switch?

The picture opposite shows a typical remote controlled socket switch. It is a socket/plug that you plug into an electrical outlet which can be controlled using a remote control without reaching for a plug.

The plug of a lamp or other appliance is simply plugged into the remote controlled socket/plug and you can then control this electrical appliance by using the the unit's remote control.





Did you know?

Climate control: Many air conditioning systems come with a remote control unit.

This learning module allows you to extend that idea of convenient remote control to lighting and household appliances.

Uses for remote controlled switched sockets (1)

Here are some ways in which a remote controlled switch socket could be used to enhance independent living



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For convenience!

There may be times when you are in bed and wish to turn on or off a light to visit the bathroom or perhaps a switch off the television.



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To prevent injury when tired

You might be going to bed and wish to turn off certain devices in the house without bending down or walking around furniture.



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Store your remote for easy access

You can use Velcro to attach the remote to a wall.

Uses for remote controlled switched sockets (2)

Some more ways in which a remote controlled switch socket could be used to enhance independent living



Awkward socket positions

There may be a socket that is in an awkward position that may not be accessed as easily as you get older.



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Safety in a dark room

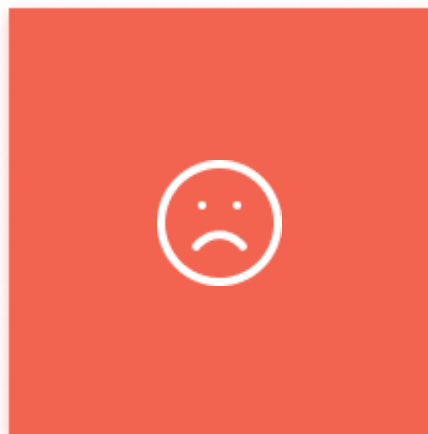
You may be watching television in a dimly lit living room and wish to turn on a light before you get up.



Bringing the remote with you

As you walk around your home you may turn on or off devices like lamps or the television. Put the remote in your pocket or attach it to a mobility aid.

Problem and solution

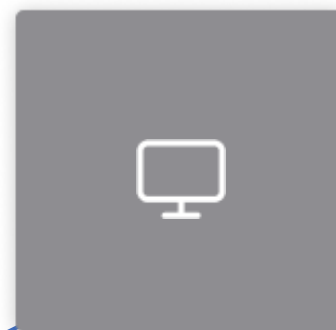


Hard-to-reach socket?

You are having trouble accessing an electrical socket in your living room as it is an awkward place

Remote control can help

Simply purchase a remote control socket switch. They cost about €10

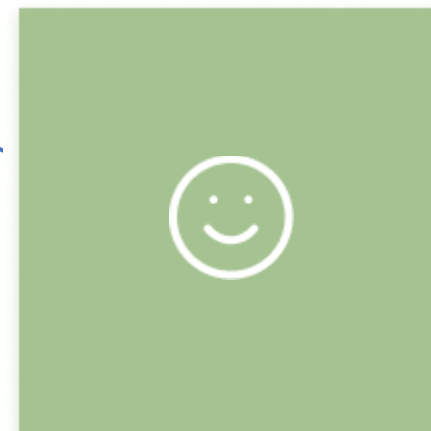


Set up the socket switch

Plug the new device into the electrical outlet socket. Now plug a lamp into the remote control socket.

Job done!

Now take your remote control and switch the light or television on and off



Good lighting practice for safety and security

Entering a dark room can have its dangers. There may be a trip hazard on a rug, a chair might have been moved, or a table placed in a different location. So to avoid injury it is important to have a room that is well lit as you move around it.

For your security you should make sure that your house has lights on timers or that you start using a remote control socket.



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Lighting and Security

Simply having the house illuminated gives the appearance that somebody is at home and is mobile around the house. Opportunistic crime is deterred when a house is illuminated.



Poor Lighting

- House looks unoccupied (but it is not).
- Trip hazards are not visible.
- Perpetrators can hide in darkness and peer in.
- Neighbors cannot see suspect individuals.



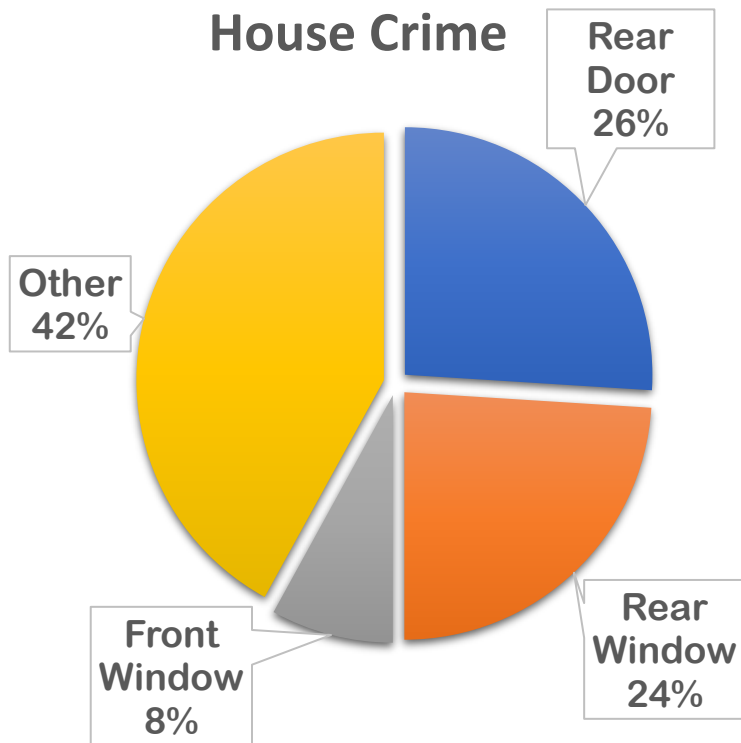
Good Lighting

- House looks occupied.
- Genuine visitors can see trip hazards.
- Perpetrators cannot hide and peer in.
- Neighbors can see suspect individuals.

Security

Burglars also commonly target back doors (26%), back windows (24%) and front windows (8%), with one in five cases involving a burglar getting access through an unsecured door or window.

Nearly half of burglaries (46%) occur between 5pm and 11pm.



46% of Burglaries

Crime Prevention



IF YOU LOVE IT, LOCK UP AND LIGHT UP.

Simple steps can help protect your home. Whether you are at home or going out, remember to turn on some lights, use timer switches, lock all doors and windows, use an alarm, store keys away from windows and letter boxes, and don't keep large amounts of cash or jewellery in the house.

Icons: padlock, lightbulb, key, envelope, alarm bell.

Quiz

Click the **Quiz** button to edit this object

  **SMART** **MODULE 8** **CHAPTER 1** Remote controlled switch sockets for independent living

Remote control switched sockets do not help independent living.

True

False

Chapter summary

1 What is a remote control socket?

2 Remote control sockets are a convenient way to control devices in your home

3 Remote control socket switches can be used to avoid injury from reaching for plugs

4 Better and more responsive lighting can help with home security

5 The material in this module will help to support better access to electrical appliances.

Chapter completed!

Congratulations! You have successfully completed this chapter!

Summary of acquired skills

1

Uses of remote controlled switching sockets

2

Good lighting practice for security in the home.

What is next?

Now you can either repeat this chapter or follow our study recommendation by clicking on one of the buttons below:

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SMART

MODULE 8

CHAPTER 2

Remote controlled switching sockets - buying options

Now that you have seen some of the benefits of remote controlled plug and socket switches you might be interested in buying one. This chapter briefly describes some technology options and some pros and cons of each option. It also notes extra features that are included in remote controlled plugs and sockets.

What will you learn in this chapter

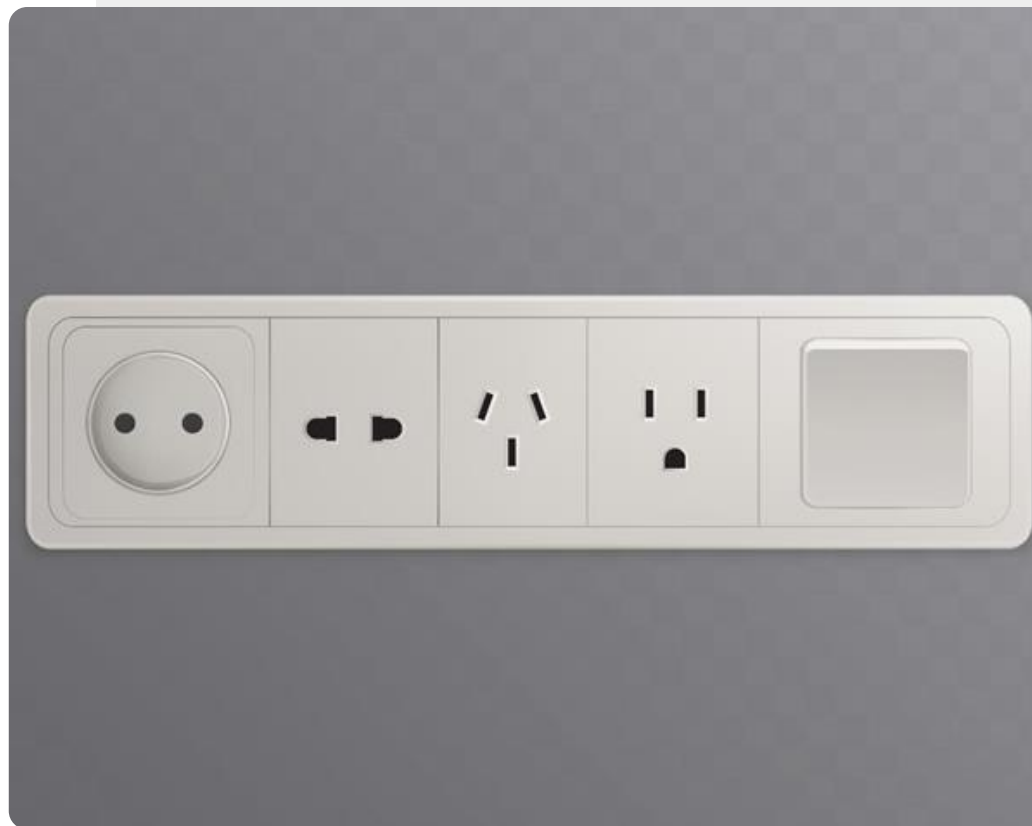
- 1 Different plug types for different regions
- 2 Infrared controlled versus radio controlled remote units
- 3 The issue of line of sight and how it impacts remote units
- 4 Extra features and using sensors



Plug types

The units discussed in this module are sold worldwide and by many manufactures under different brands. So for illustration purposes the sockets shown are of the type used in the United Kingdom and Ireland, the three pin TYPE-G.

But similar units when purchased in a local hardware store will have a local socket TYPE and will be rated for the local electrical regulations.



Infrared versus radio controlled switching sockets and plugs

There are two main types of remote control system that can be used for remote controlled socket switching. The next few slides talk about the technologies used and mentions some features of each approach



Infrared (IR) remote control

When you change channels on a television set, you are usually using an Infrared (sometimes called IR) remote control.



Radio (RF) remote control

If you use a remote control fob to lock and unlock your car you are generally using a form of radio (sometimes called RF) based remote control

Infrared (IR) type remote systems

Your television remote operates by transmitting infra red light signals to the television. The IR light signal indicates that you wish to change channel or adjust volume.

An infra red remote doesn't work if the path of light is blocked by a person or other object.

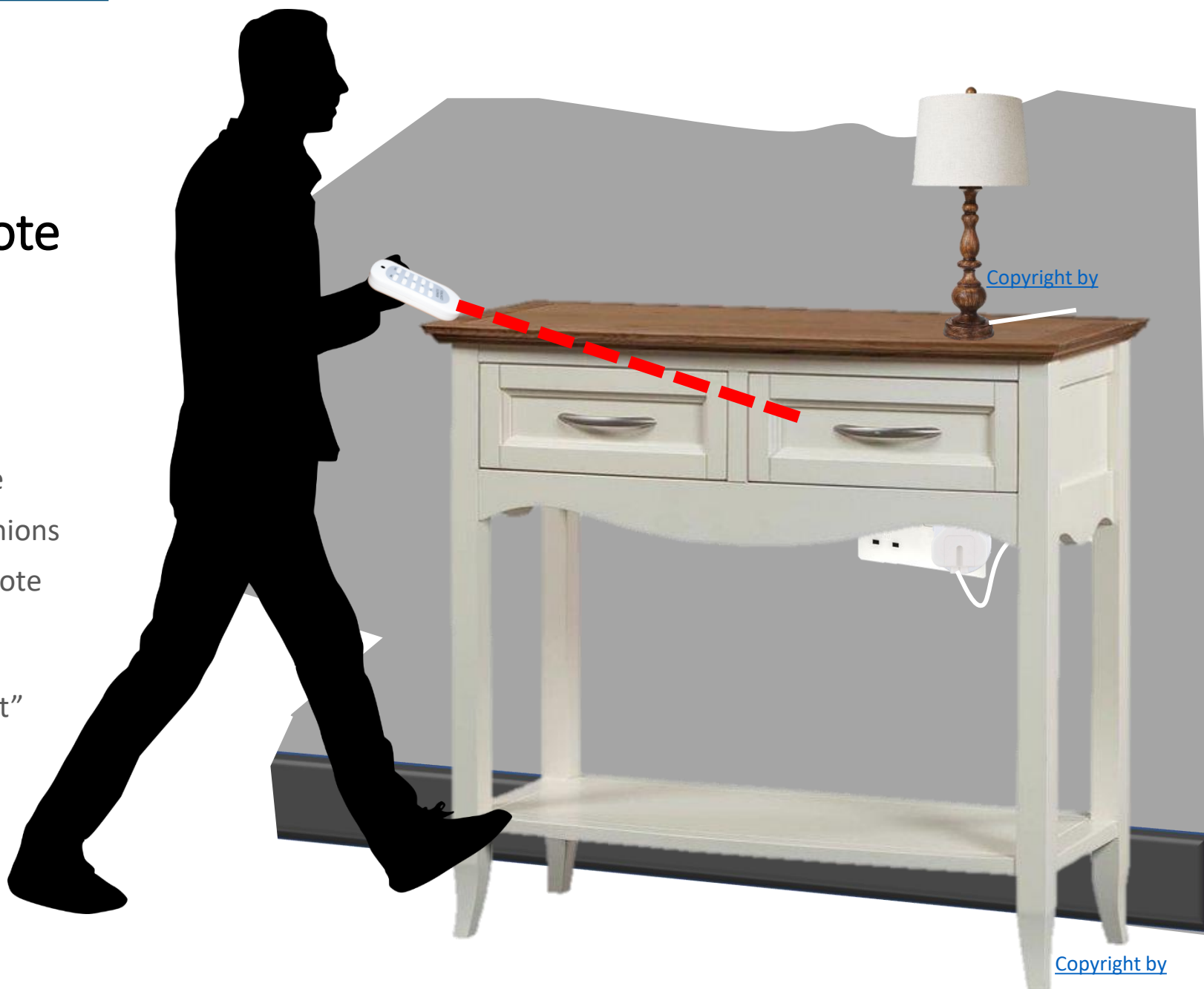
Try this yourself: use the remote to change channel on the TV when a chair or your body is blocking the signal.



Infrared (IR) type remote systems issues

In the same way as for the television remote control, furniture in the home such as tables, chairs, books and cushions can all block the IR light from the remote control to the appliance.

Remember it needs clear “line of sight” between the remote control and the appliance to operate correctly.

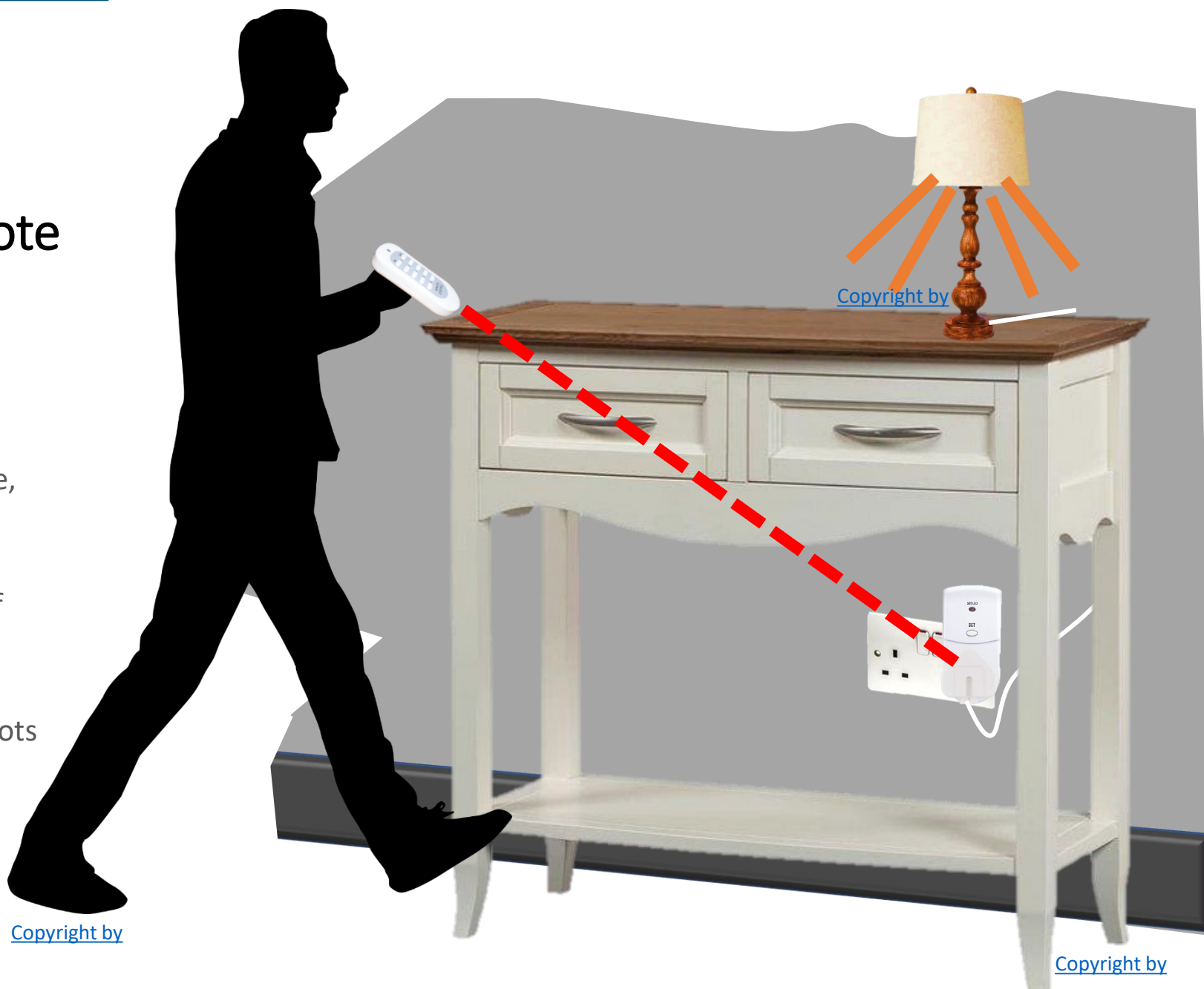


Infrared (IR) type remote systems issues

If the furniture in the home does not block the line of sight there is no issue, and the system works.

But will there always be a clear line of sight?

Shopping bags, umbrellas, cups, and lots of other things can get in the way



Radio controlled (RF) remote systems

Another popular signal that is used for remote controls is radio signal.

Lets think about how radios can work in the home. If the radio is in a fixed location, it is unlikely that your movement around the room will distort the radio reception. Even if the radio is turned around, the reception is unaffected.

The reason for this is that the radio signal penetrates through people, walls, doors and windows. The signal does not need line of sight between the remote control and appliance to operate correctly.



Radio (RF) controlled remote systems

Have you ever forgotten where you parked your car?

By simply pressing the radio remote control, the hazard lights on your car can be triggered. Helping you locate your car.

You might not be pointing the remote in the correct direction or perhaps you are not even on the same car park floor.

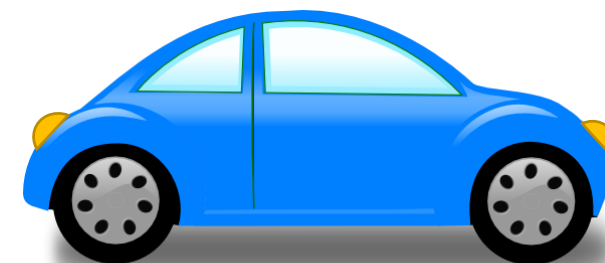
This demonstrates the strength of the radio signal and its ability to penetrate different materials, yet still operate effectively.



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Radio controlled remote systems

Radio controlled switched sockets can turn on and off lamps, televisions and a host of other appliances using mains electricity. Lights can be turned on in rooms before you go in to the room.

Or you can simply switch on and off appliances as you wish.

So, it is possible to make a house look lived in without leaving your chair.



IR and RF are both wireless technologies

You can see from both the infrared and radio remote controls that there are no wires connecting the remote device to the appliance. Hence, both techniques are classed as “wireless”.

If you are ordering devices online you may be confused as both will use the term “wireless”. But by looking on the box you should be able to see the difference. The term RC (Radio Controlled) or IR (Infrared) can tell you more about the product.



Just for fun.

Although you cannot see the Infrared light from a television remote control with the naked eye. We can use a camera on a phone to see it.

This is a little trick ‘just for fun’ you can play on children, or perhaps you want to make sure a remote control is actually working.



Let's look at the whole system.

One common error when using a remote controlled socket adaptor, is turning off the appliance using its own switch.

It is important to turn **ON** and **OFF** the appliance using the remote controlled adaptor instead.

But it is easy to forget.



Extra features of remote controlled switching products

Here are some extra features that can be included on some remote-controlled socket and plug switches. In general the remote control unit can also override the built in sensor.



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Light sensor – darkness sensitive

Some switching devices include a light sensor that detects the onset of darkness and will turn on the socket automatically.



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PIR sensor – movement sensitive

Other devices include a Passive Infrared (PIR) sensor that can detect a moving human body or a large dog, and use this sensed action to turn on the socket.



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Time-based control

Some remote controlled socket switches include a programmable timer.



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Light sensor and PIR sensor explained

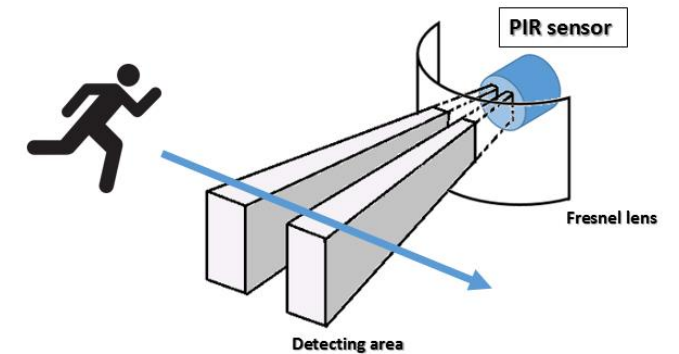
Light sensors detect the energy from the sun and can determine if there is enough natural light. The sensor is commonly found on street lighting where lamps that detect a lack of natural sunlight automatically switch on.

PIR sensors are sensitive to body heat and when a person moves in front of the sensor it triggers an action. This event can be used to automatically turn on light or sound alarms.

In modern security light devices both the light sensor and PIR sensor are included within the one lighting unit.



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Quiz

Click the **Quiz** button to edit this object

  **SMART** **MODULE 8** **CHAPTER 2** Remote control switching sockets – buying options

Some remote control switched sockets include Passive Infrared (PIR) activation.

True

False

Chapter summary

1

There are different types of remote control socket systems that you can buy

2

The infrared based remote control sockets are very common and inexpensive

3

Infrared based remote control sockets only work in line of sight between the remote and the socket

4

Radio based remote control socket systems do not require line of sight

5

Some products come with extra features using sensors

6

Sensors on remote control sockets can detect changes in light, or when a person passes

7

Some products can also respond to time as will be described in the SMART lighting module

Chapter completed!

Congratulations! You have successfully completed this chapter!

Summary of acquired skills

1

Knowledge of the features of infrared and radio controlled sockets

2

Knowledge about extra sensors that you may find on some remote controlled sockets.

What is next?

Now you can either repeat this chapter or follow our study recommendation by clicking on one of the buttons below:

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SMART

MODULE 8

CHAPTER 3

Socket and plug safety – is there too much current?

You should check that your socket or plug can cope with the current that will power the attached light. This is true for any plug or socket, whether it is a standard one or remote-controlled. Otherwise the plug or socket could overheat or even cause a fire. This chapter looks at how to check that your socket is safe.

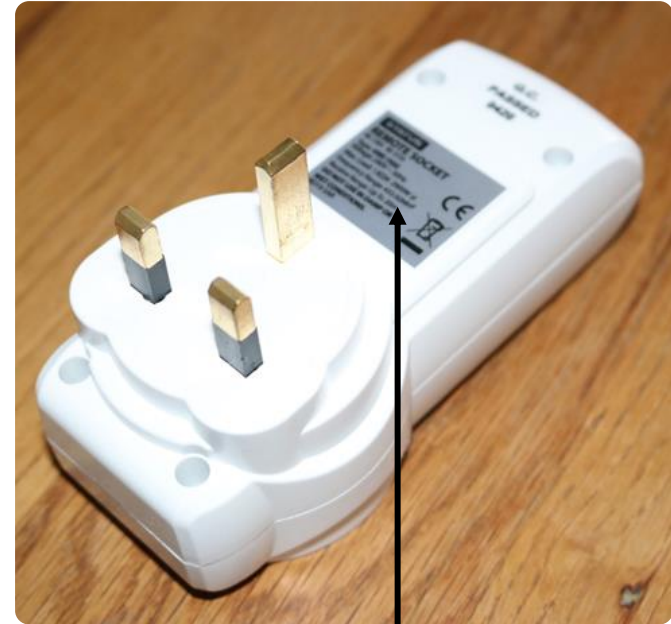
What will you learn in this chapter

- 1 Maximum current rating – what is it?
- 2 How to read the current rating for your socket
- 3 Comparing socket current rating to the rating of the connected appliance

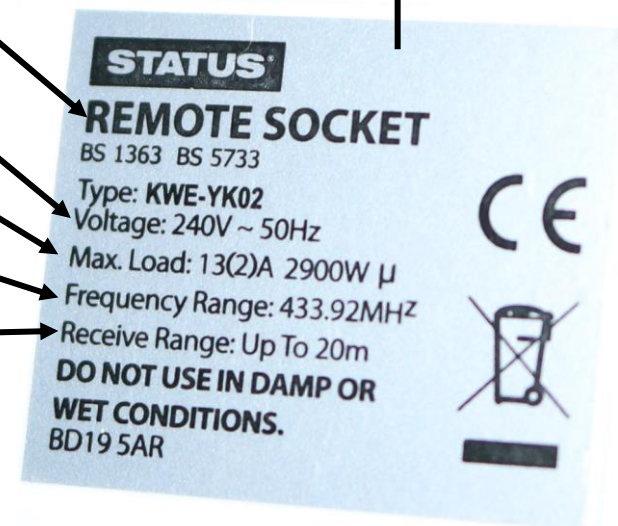


Maximum current rating of switched sockets

On the back of the switchable remote socket there will be some product information. It is important to understand and comply with this information.



Type/model:
Voltage:
Max Load:
Frequency Range:
Received Range:

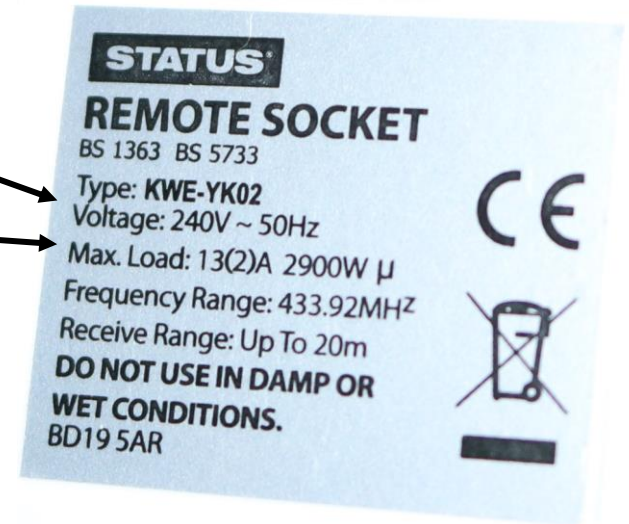


This unit can transmit up to 20m.

Maximum current rating of switched sockets

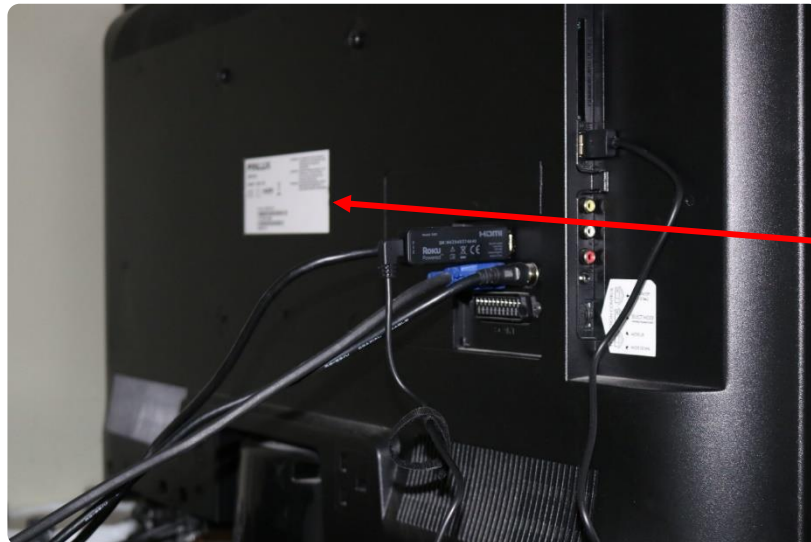
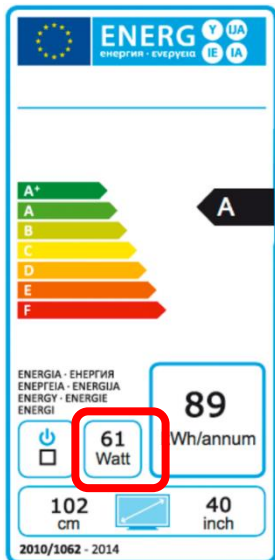
It is important that the rating of your appliance does not exceed the rating of the switched remote socket. Appliances in the EU will display this colour energy rating label.

If you cannot see or perhaps have thrown away the packaging, you can look at the back of the appliance and you will see the voltage and watts. In this case 75W is well under the rated 2900W, so this appliance is suitable to be used with this remote controlled switched socket set.



Voltage:

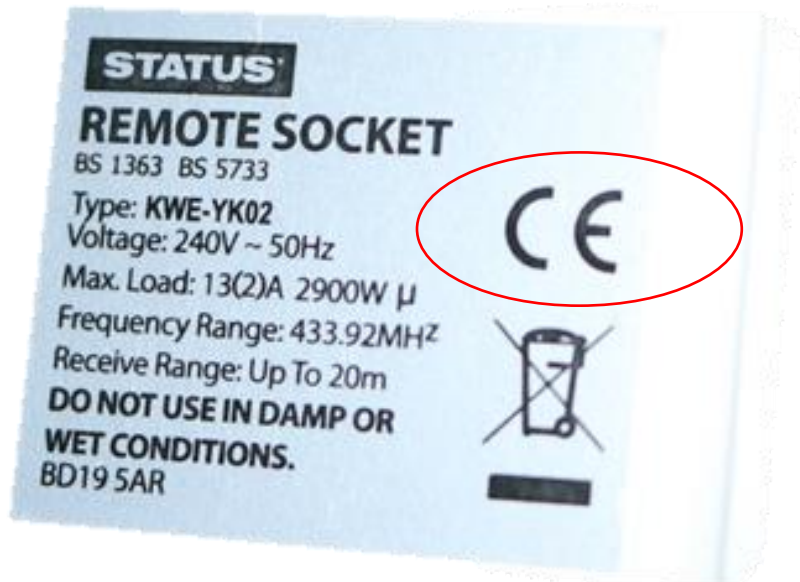
Max Load:



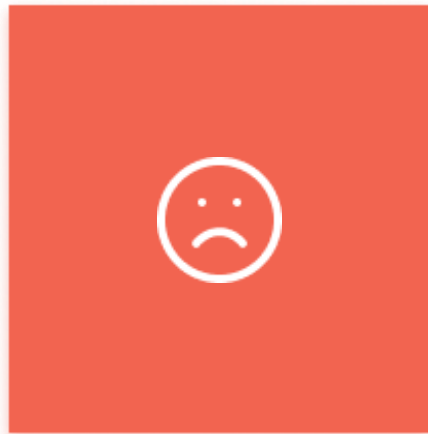
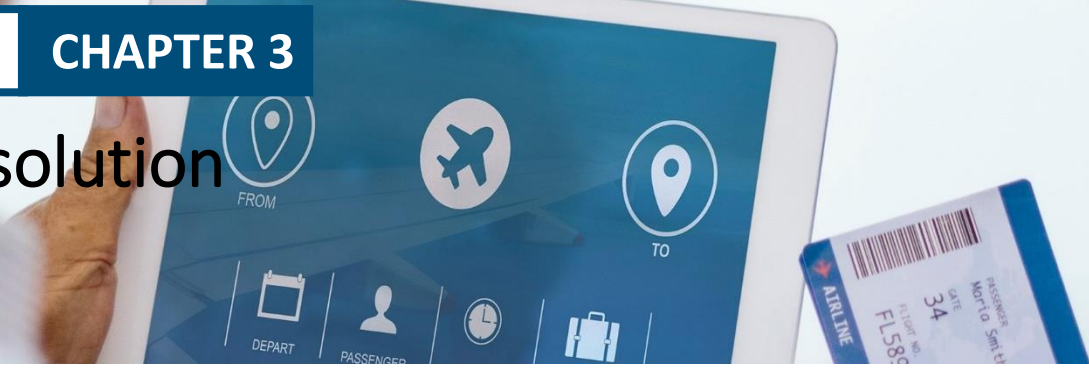
CE mark

CE marking is an administrative marking that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.

It is good practice to ensure your appliances have this mark before you purchase them.



Problem and solution



Worried about current?
You are concerned that remote controlled switching socket cannot support current in a lamp

Check lamp current rating
This will be printed on the bulb of the lamp an often on lamp stand as well





Check socket rating
Use instructions to check rating of the remote controlled socket. Is it higher than lamp rating?

Job done!
If socket current is higher than lamp current then you can use socket with lamp.



Quiz

Click the **Quiz** button to edit this object

  **SMART** **MODULE 8** **CHAPTER 3** Socket and plug safety Is there too much current?

It is good practice to make sure your appliances carry the European CE mark.

True

False

Chapter summary

1

Maximum current rating on a remote controlled socket

2

How to determine the maximum current rating on a remote controlled socket

3

Checking that the maximum current is enough for your light or appliance

4

This will help with selecting an appropriate remote controlled socket for your appliance

Chapter completed!

Congratulations! You have successfully completed this chapter!

Summary of acquired skills

1

Know about concerns related to over current.

2

How to find the current rating for your socket.

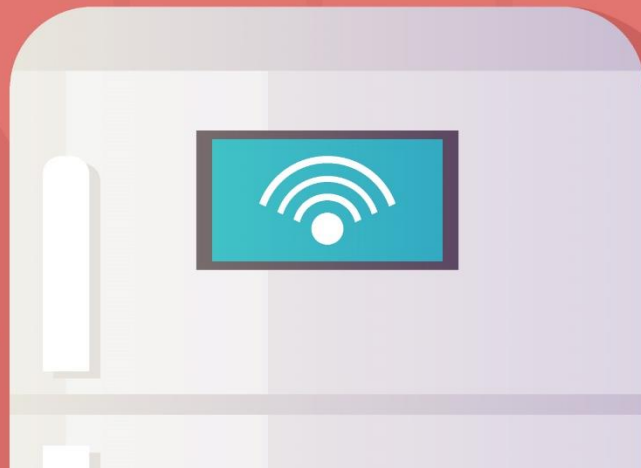
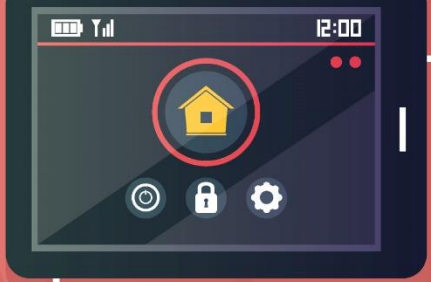
3

Comparing the socket current rating to the rating of the appliance it is connected to.

What is next?

Now you can either repeat this chapter or follow our study recommendation by clicking on one of the buttons below:

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SMART

MODULE 8

CHAPTER 4

Pre-configured versus installed remote controlled sockets

If a house needs to be rewired anyway, you could pay the electrician extra to install remote controlled lights, blinds and windows. The home becomes a smart home with highly integrated devices. However, retrofitting a home in this way can be expensive. Here we compare installed versus pre-configured systems.

What will you learn in this chapter

- 1 Installed remote control systems are highly integrated and generally support other smart features
- 2 Installed systems are expensive to install as this is done by professionals
- 3 By comparison the pre-configured remote socket sets are inexpensive and easy to install and operate individually



Pre-configured versus installed systems

For most people the inexpensive pre-configured option is suitable. Others prefer the state-of-the-art but much more expensive integrated smart home solution. The next few slides briefly discuss these options.



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Pre-configured remote systems

It is not difficult to make a home “smart” to assist the occupant. There is no requirement to rewire the home and no need for an electrician to install equipment



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Installed “smart” remote systems

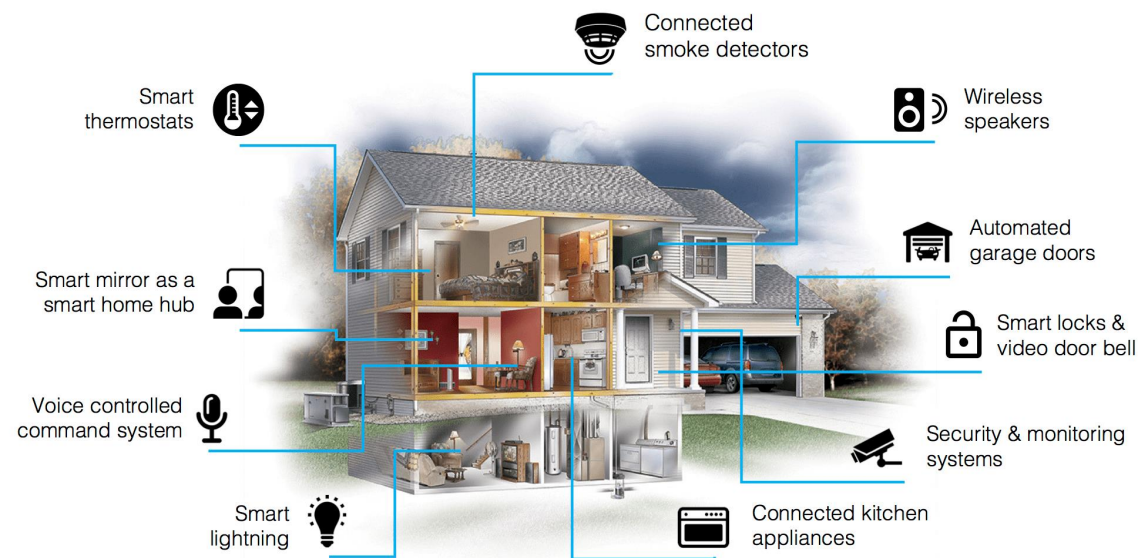
If you have the opportunity if your home is rewired, you can pay extra to install an integrated “smart” remote control system. This can be expensive!

Installed remote control systems

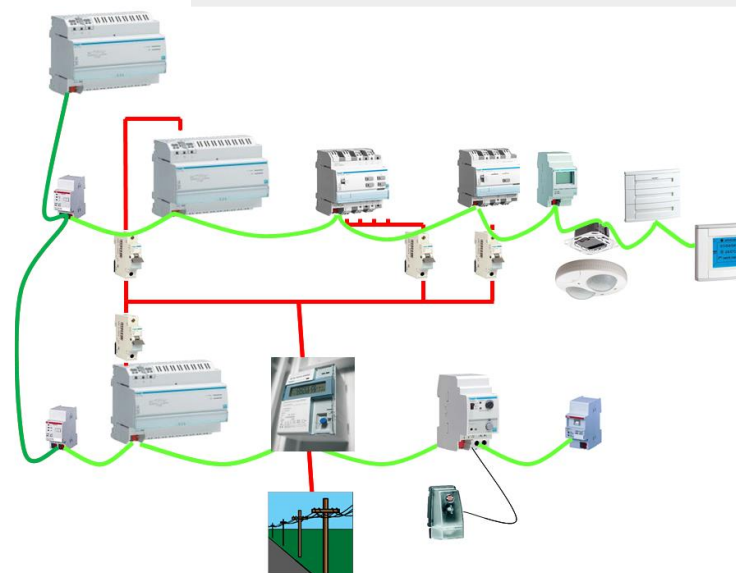
Installed systems refers to devices and appliances that have been fitted to, or installed inside, a building. They are not restricted to power outlets. It can be difficult and expensive to retrofit a home, hence, most installed systems are considered for new buildings.

These systems are fitted by qualified professionals and also need to be configured and programmed. They use wires or wireless radios to transfer information between different devices. The transfer of information can be achieved over power cables or using special network cables.

The ability to integrate the functionality of different devices and appliances together within the building can be easier.



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Pre-configured remote controlled systems



Pre-configured controlled switched sockets use existing sockets in the home, where a switching device is plugged in. There is no need for rewiring or complex configuration setup software. The plugged in device usually has a socket outlet. So the device acts as a switch to turn on or off the device outlet, which connects and disconnects power to the outlet socket. Many manufacturers provide different options and they are commonly found in hardware shops.

The application is similar to a timed socket device, but instead of a timer, a remote control can be used to turn on or off the output. Alternative devices to the time clocks or remote controlled sockets are units that detect daylight and can turn on lights when the day or space gets dark.



Quiz

Click the **Quiz** button to edit this object

  **SMART** **MODULE 8** **CHAPTER 4** Pre-configured versus installed remote controlled sockets

All remote controlled switched sockets have to be wired into a control system.

True

False

Chapter summary

1

This chapter has contrasted installed and preconfigured remote control systems.

2

Installed systems are highly integrated, and support links to other smart features

3

However, installed systems are expensive to install as this is often done by professionals

4

Pre-configured remote socket sets are inexpensive and easy to install and operate

5

You may now proceed to the next chapter.

Chapter completed!

Congratulations! You have successfully completed this chapter!

Summary of acquired skills

1

Know that integrated systems are expensive and are installed by electrician

2

Awareness that pre-configured remote controlled sockets are inexpensive and can simply be plugged in.

What is next?

Now you can either repeat this chapter or follow our study recommendation by clicking on one of the buttons below:

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Module summary

1

How remote controlled switch socket could be used to enhance independent living.

2

Options that can be included with some of the set packages, e.g. PIR or light sensors.

3

Difference between IR and RF remote systems and issues regarding “line of sight”.

4

Determining the the maximum current rating of switched sockets.

5

Aspects of safety and security relating to good lighting practice.

6

Differences between pre-configured remote controlled switched sockets and controlled sockets.

7

This module has given a good overview of an inexpensive and useful smart home technology idea.

Module completed!

Congratulations! You have successfully completed this module!

Summary of acquired skills

1

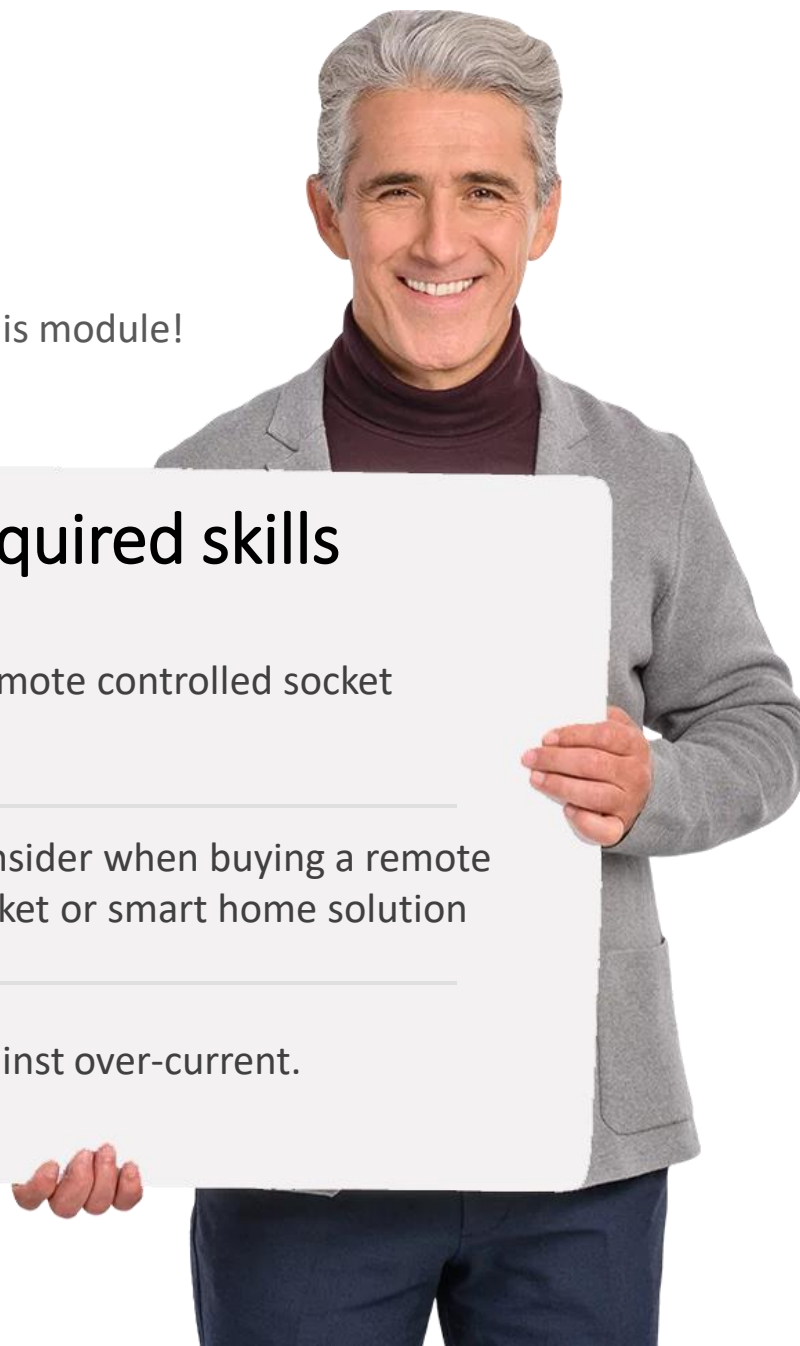
The uses of remote controlled socket switches.

2

Options to consider when buying a remote controlled socket or smart home solution

3

Protecting against over-current.



What is next?

Now you can either repeat this module or follow our study recommendation by clicking on one of the buttons below:

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