

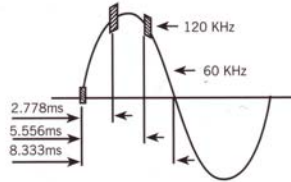
What is X-10?

By Dr H Kaveh, WHOME

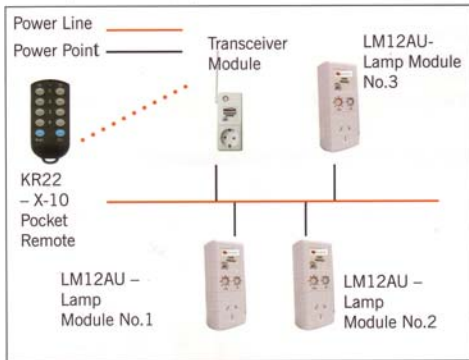
X-10 is an industry standard for communication among devices used for home automation". X-10 communications are achieved through the household power lines.

That means no additional lines are required to be installed. The advantages of this are the ease and simplicity of control. Most wireless communication devices are unreliable and can't go through some objects. All households have a power outlet or electrical lighting in every room and hence the entire house can be controlled. X-10 communication is established by either built in devices or plugged in devices. Built in devices are installed within your power lines and plugged in devices are put into your power points. Therefore the entire house becomes X-10 active. That is you could for example turn an appliance on or off from another room. X-10 is used by many companies to create home automation. One in particular is W home (www.whome.com.au). They have a wide range of X-10 home automation devices such as the LM12AU. The LM12AU is a lamp module that allows lights such as lamps to be turned on and off or dimmed.

equally advanced devices to respond with their status. This status may be as simple as "off" or "on", or the current dimming level, or even the temperature or other sensor reading. Devices usually plug into the wall where a lamp, television, or other household appliance plugs in; however some built-in controllers are also available for wall switches and ceiling fixtures.



Digital data is encoded onto a 120kHz carrier signal



For example consider the circuit given above. Let's say Lamp Module (LM) No.1 is up stairs and No.2 and No.3 and the Transceiver Module are down stairs in your house. If you wanted to control each light individually you would set the house code to A and unit to 1 to 3 respectively. The transceiver module accepts Radio Frequency (RF) signals. It then converts this to X-10 which is sent over the power lines. Since all the LM's are connected to the same phase that will see these X-10 signals and act accordingly.

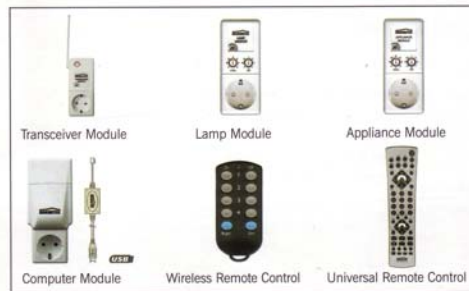
How does X-10 function?

The X10 protocol operates by using household electrical wiring send digital data between X10 devices. This digital data is encoded onto a 120kHz carrier signal which is transmitted as bursts during the relatively quiet zero crossings of the 50 or 60Hz AC alternating current waveform. One bit is transmitted at each zero crossing, where a Binary 1 is represented by a 1 millisecond burst of 120KHz. at the zero crossing point and a Binary 0 by the absence of 120KHz. The digital data consists of an address and a command sent from a controller to a controlled device. More advanced controllers can also query

How can I use X-10?

W Home provides a wide range of products for home automation which include:

- lighting starter kits – control your lights and appliances remotely
- computer starter kits – program timed schedules for your lights and appliances
- TV room starter kits – control A/V equipment, lights and appliances from one remote
- computer modules – control operation of modules via your computer
- lamp modules – facilities both on/off and dim/brighten commands
- appliance modules – on/off function to control appliances
- transceiver modules – responds to RF signals from any X-10 wireless remote
- universal remote controls – one remote for all your equipment.



For more information contact W Home. ■