

Over the years we have had a lot of questions from our customers on the X10. This technical bulletin is aimed at sharing the X10 story.

WHAT IS X10 System?

X-10 is not just a name of products we install in our walls and plug into our outlets; it is a name for the signal that controls them. X-10 is a low voltage signal that is passed through the electrical wires of our homes. This signal has no effect on computers, TV's and other electrical devices. This signal is transmitted when the voltage is at 0 volts. This is possible because alternating current (A/C) works is by alternating the phases 50 times per second.

This is why we sometimes hear a hum in electrical devices. This hum is a 50 Hz hum caused by the alternating voltage. If we could see this fast and light filaments didn't dim off, we would be able to see the lights flashing 50 times per second. This cycling allows a period of time when X-10 signals can be transmitted. The battery in your car always has a constant voltage and is called Direct current or DC.

Most X-10 transmissions are less than 1 volt in strength. Most X-10 receivers need at least 100mv to be able to respond. If there is excess noise in your electrical system, this will cause problems with signal transmissions. Such things as computers, surge suppressors, TV's and many other devices may cause excess noise. If the noise is at a higher level than the X-10 signal, then the signal cannot be seen or responded to. The solution is simple, you can always eliminate them from reaching your X10 devices by simply plugging the noisy device through an [FM10 plug in module](#).



X-10 signals can only be transmitted one at a time. If two signals are transmitted at the same time, they will collide and no action will take place. This is only true if the signal is on a different code. If the signal is on the same code, a feature in the X-10 receiver will ignore the repeated signal. This circuitry is needed in order to allow the amplified couplers/repeaters to function. Below is a more in depth summary of the things listed above.

Methods of Controlling X-10

There are several methods used to control X-10. There are devices that can turn IR commands into an X-10 signal. RF remotes that allow remote operation of X-10 for distances of 100's of feet. Desktop controllers are a popular method of controlling. They sit on a tabletop and have simple switches to control the desired module.



X-10 makes a clock ([MT10](#)) that can be used for simple timing of lights and more. Some new alarm panels have X-10 capabilities making it possible to perform functions like turning on the lights when you disarm the alarm or flashing the lights if the alarm is sounding.



X-10 makes motion sensors MS13, that transmit wireless signals to RF receivers that can be used to turn on lights in a bathroom at night or turn on the outside lights when someone approaches the house.



Also there is a switch that is made to look like a regular [wall switch \(SS13\)](#) but will transmit to other X-10 switches. This switch is less than 7 mm thick and can be mounted anywhere with no wiring. There are really too many transmitting devices to list but searching can reveal most.



[Computer Interfacing](#)

There are several computer interfaces that allow you to link your X-10 to a computer to allow automation. Price ranges are from under \$10.00 to over \$1000.



One thing that most people try to get by without is a coupler. A coupler is a device that connects both phases of A/C voltage in your home ([FM10](#)). A coupler is a device that couples the X-10 signal to the other phases in your home.

In most applications at least one of these is needed to ensure X-10 signal completions.