**X10 Tutorial:**

**How to automate your home on a shoestring budget - Part 2.**
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In the previous tutorial, we introduced you to how to get started automating your home with just two devices. Now it's time to increase our abilities for automation by adding modules.

**Modules**, are devices that when they receive a command, they perform what they are designed to do. They do not re-transmit signals back to the remote control nor do they transmit signals forward to other modules. They only perform one task, and that is to either turn a unit on or off. Some modules have the ability to dim and brighten, and others have features which are specialized for their chore.

*Here is a lamp module as seen from multiple angles.*

Modules vary in styles, sizes, and pricing, with basic modules starting around $12.99 USD.

Modules are necessary in order to increase the amount of items in your home that you will be able to take control of as you continue to automate.

For this tutorial, we will be adding three new modules to our current setup:

1) The LM465 Lamp Module ($12.99)
2) The LM15A Socket Rocket Module ($19.99)
3) The AM14A Appliance Module ($12.99)


The **LM465 Lamp Module,** is a specialized module with the ability to turn a light source on and/or off, and also the ability to dim or brighten a lampshade, even if the lampshade can not do this on its own. To use the **LM465 Lamp Module**, simply plug your lampshade into it, then plug the module into the electrical outlet on the wall.

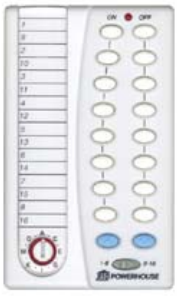
The **LM15A Socket Rocket**, is a module that is different in the sense that to use this module, you don't plug it into a normal 110 volt electrical outlet, but you twist it into a light socket with the light bulb attached (also by twisting the bulb on to the socket rocket).


The **AM14A Appliance Module** appears to look like the **LM465 Lamp Module** but is designed for the use of appliances such as an electrical coffee maker or toaster oven. When hooking up appliances only use an appliance module, and never a lamp module, as lamp modules are not designed to handle appliances. You can however use lamps and lighting sources for appliance modules.

In order for a module to function properly you must have the transceiver plugged into an electrical outlet. You send the command from your remote control to the transceiver, the transceiver then distributes the signals out to the modules. Without the transceiver, your modules can not receive remote commands.

Recall back to the prior lesson where on the transceiver module (and on some remote controls) we discussed the switch on the front which was lettered from A to P? This is where knowing what this means comes in to play. You'll notice on each module that this switch is also present. In addition, another switch with numbers 1 to 16 is also present next to or below the switch with the letters.

The letters represents the *letter frequency* to be used, allowing the remote, the transceiver, and the three modules to communicate. If all of the devices are set to the same letter code then all of the devices are communicating on the same letter frequency. If one module is set to a different letter than the transceiver or the remote, this module is not communicating with the transceiver and will not respond to commands you send by the remote control.



*HR12A Palm Pad Remote Control*

With the three new modules we are adding to the system, we can make them respond in different ways. For this example, we are going to use a **HR12A Palm Pad** remote control, which gives you the ability to control up to sixteen separate modules.

If we want all three modules to turn on at the press of one button from the remote, we would manually set all of the modules onto the same number frequency. Then by clicking the On button on the number position of the remote all three modules will simultaneously turn on. When you press the

Off button from the same number position on the remote, all three modules will turn off.

If we want two of the modules to respond to the number 1 ON/OFF position on the remote but want the third module to respond to the number 2 ON/OFF position on the remote, you would manually change the switch number of only the third module to #2 ( but leaving it on letter A). Remember, they are all still communicating on the same *letter frequency*, You just re-positioned the third module to respond to a different *number frequency*, which can be controlled from the number #2 ON/OFF position from the remote.

So, the number switch (1 – 16) on the module represents the *number frequency* that the modules respond to. You can have multiple modules set to the same number frequency and respond simultaneously at the press of a single button on the remote, or you can have them respond individually by re-numbering them to respond to their own button on the remote. This allows you to set up your system at your own preference.

Since the number frequency goes as high as sixteen, this means you can have up to sixteen modules running off of one letter frequency. If you add more modules, these will have to be placed under a different letter frequency, but this also means that you will need a second transceiver also placed under that new frequency, and possibly another remote unless you want to keep changing the letter frequency on the remote by hand back and forth from the original letter frequency to the new letter frequency you just added.

In the event your neighbor is using a similar home control system, you may notice your lights or appliances turning on or turning off. If this is the case, simply change the letter frequency on your remote, transceiver and your modules. This will prevent your home automated system from talking with your neighbor’s system.

## Definitions:

**Appliance Module:** A module designed for controlling appliances such as a blender, coffee maker, and more.

**Lamp Module:** A module designed strictly for controlling a light source such as a lampshade.

**Letter Frequency:** An initial signal of how modules, remotes, and transceivers communicate. In order for them to communicate they must be under the same letter frequency.

**Module:** A device that when sent a signal, performs a function.

**Number Frequency:** A secondary signal of how modules, remotes, and transceivers interact. All must be under the same letter frequency to communicate, but can be placed under a different number frequency to identify them as an individual or a group.

## Troubleshooting:

*When I press a button on the remote, there is no response from my module.*

1) Do you have batteries installed in the remote?
2) Is your device plugged into the module?
3) Is your transceiver plugged into an electrical outlet?
4) Is your module plugged into an electrical outlet?
5) Is the switch letter on the module the same as the letter on the transceiver and remote control?
6) Is your module within 100 feet of your transceiver?