SOLUTIONS

Master of the House

Home automation technology is fun and affordable. Here's how to get started. **BY BILL HOWARD**

Home automation—using a PC and several additional attachments to control home appliances remotely—is a popular and growing field. Even if you can't afford a butler or housekeeper, you can screen visitors at the front door, set your lights and thermostat without lifting a finger, and more.

LET YOUR PC DO IT

Home automation comprises PC networking, shared Internet access, telephone communications, home security/surveillance, and automated/remote-control lighting and HVAC (heating, ventilation, air-conditioning). Eventually, it will encompass home chores, too. There are already robotic vacuum cleaners and lawn mowers with limited capabilities.

You could easily spend $50 a square foot to automate a showpiece home—a hefty price considering an upscale, 3,000-foot home costs about $150 a square foot to build. But $1,000 can provide you with automation tools to make your life easier and amaze your neighbors. Even $100 is enough for a starter kit to control half a dozen lights from your PC, from a PC-programmed timer, or from a wireless remote that's small enough to fit on a keychain. Here we'll recommend a shopping list around which to base your budget.

THE X10 MYSTIQUE

At the heart of most home automation schemes is a 25-year-old standard called X10. It's a method of transmitting signals over electrical wiring. The signal is at a much higher frequency than the 60 Hz your wiring uses, so the signal can be readily distinguished by a receiver/sensor. Receivers plugged into wall outlets or embedded in light switches "listen" for signals and react as necessary, flipping a switch to turn lights on or off (or dimming them), starting a coffeepot, and so on.

Remote coffeemaking is a good example of what is possible yet not advisable. X10 signals are very reliable, but they can be interrupted by surges or drop-offs in the power lines. Damp weather or even an appliance being off can affect the performance of an X10 receiver. So any device that could be dangerous if not turned off properly shouldn't be controlled by X10. A porch light is no problem, a sprinkler would waste some water, but a space heater or coffeemaker could overheat.

Workarounds have evolved, such as sending the same command two or three times in succession if you're using a PC-based controller or a simple clock timer that sends two on and two off commands (1 minute apart) per daily cycle. Getting the signal through the first time is a good reason to buy high-quality switches and to install signal boosters (that plug into a wall outlet) or breaker-box couplers. (Most homes have two electrical legs, or *pathways*, connected only when a 220-volt appliance runs. A coupler bridges the legs.)

Most X10 users also have wireless remotes, which use radio frequencies (not infrared), so you don't have to be in the same room as the receiver. Most X10 starter kits include a wireless remote that controls X10 and audio equipment, as well as a small keychain remote that lets you turn on devices from outside the house.

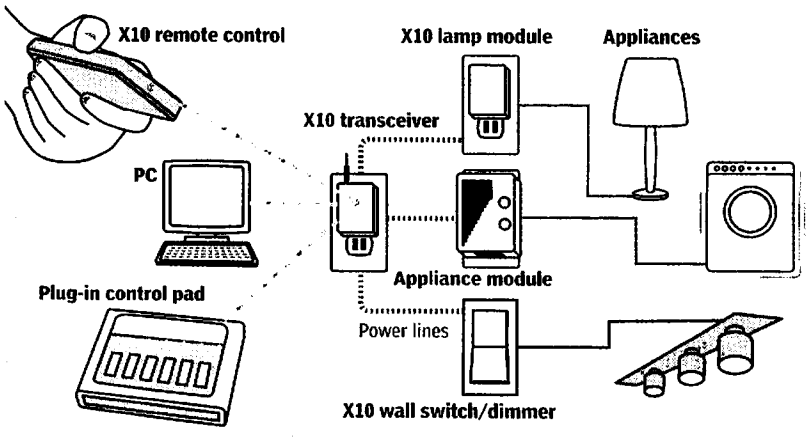
A fertile area for the future of home automation is energy-intensive water heaters, air conditioners, dishwashers, and dryers. You could turn the heat up at your home in New England just as your plane from the Caribbean was landing or reschedule a dishwasher to run at night, if electricity rates are cheaper then.

LIGHTING CONTROLS

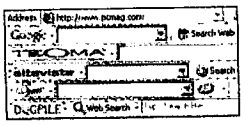
To most people, home automation means pushing a button here and the lights dim

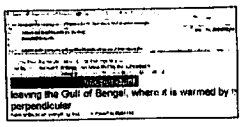
X10 Technology

Using high-frequency pulses, X10 products communicate through your electrical wiring and control lights, HVAC, kitchen appliances, and more.

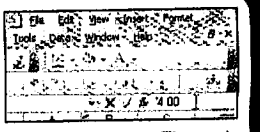



60 Office: Graphics formats.


'62 Internet: Google search toolbars.


64 Security Watch: Detect spam schemes.


66 Enterprise: Antifraud compliance.


69 User to User: Tips and tricks.

MAKING TECHNOLOGY WORK FOR YOU

over there. Although high-tech homes use dedicated wiring (running to a basement or garage control panel), and there are a couple of proprietary solutions (Lutron, *www.lutron.com*, is one player), most users opt for X10-based devices.

Don't buy cheap. A Leviton or X10 Pro wall switch for $45 is a better deal than a basic X10 or RadioShack switch for $15. The former resists interference, lasts longer, and can, for example, dim lights directly without turning them all the way on first. To start, use an X10 clock/controller ($25, *www.x10.com*) that runs four lights. (Each of the four can be several lights set to any one of X10's 256 addresses.) A more versatile choice is a PC interface ($25 to $100, included with most X10 starter kits). It's a wall outlet module with battery backup and a serial or USB cable connection to your PC. The software lets you control more lights in more interesting ways, such as dimming four lamps to different levels for TV watching and adjusting outdoor lights to come on in relation to sunset or sunrise. When you unplug the controller from your PC, it remembers the programmed settings.

SECURITY

When you're in the market for a new alarm system, ask whether the alarm panel can tie into your computer network. If so, you may be able to monitor the alarm via a Web browser. You may also want to consider security cameras. For PC users, Ethernet cameras from D-Link, Panasonic, and Toshiba start at $200 (wireless and tilt/pan cameras cost more), and you can access them over the Internet.

If you opt for an Ethernet camera for outdoors, buy a weatherproof housing, since few cameras are meant to withstand the elements. You can also use traditional cameras and then convert the analog video signal to digital so it can be transmitted efficiently over Ethernet. Our experience with X10-brand wireless cameras is that the price is attractive, but the signal doesn't carry anywhere near the claimed 100 feet; you might try an X10 wired camera for cheap ($50), but we weren't very impressed with their quality when we tested them.

You can monitor an Ethernet camera from any Web connection, or a third-party provider can monitor your cameras for a monthly service fee. Providers include Inetcam (*www.inetcam.com*) and Xanboo (*www.xanboo.com*). If you're not at a Web browser when an alert sounds, you can log on later to see who it was. Down the road, you'll be able to monitor from a color-screen cell phone.

$1,000 SHOPPING LIST

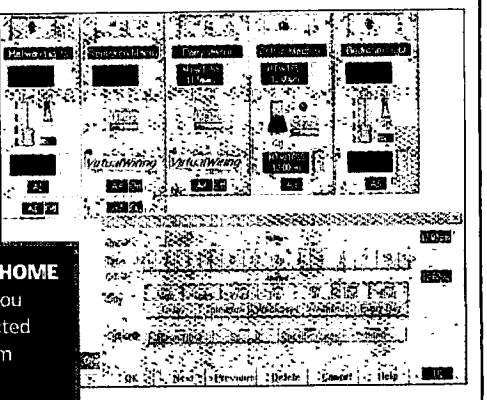
If you're looking to invest $500 to $1,000 in home automation, consider the list below to get the most bang for your buck. Let's assume you already have a broadband modem connected by wired Ethernet to your PC, and you don't have any major remodeling planned.

- Get an X10 starter kit with PC programmability ($50).
- Add half a dozen X10 Pro or Leviton X10 switches—mostly in your living room—including one scene-controller switch. Save two remote switches for your front and side door lights ($40 per switch).
- Add a Wi-Fi wireless access point and wired Ethernet switch ($75 plus $50 for a notebook Wi-Fi PC Card or desktop USB-to- Wi-Fi adapter), so you can roam the house with a notebook.
- Install an Ethernet monitoring camera aimed at the front door ($200, plus another $100 for a weatherproof housing).
- Install a whole-house surge suppressor to protect all your electronics ($250, installed by an electrician).

NEXT STEPS

Once you're hooked up, you may want better and more versatile switches. Higher-end PC control software, particularly HomeSeer ($150 direct, *www.homeseer.com*) and Advanced Quonset Technology's Home Control Assistant ($80 to $250, *www.advancedquonsettech.com*), give you added flexibility. If you have a Pocket PC device with a Wi-Fi adapter, Nevo (*www.mynevo.com*) software can issue X10 lighting commands.

You may want to add programmable switches in the walls, too. In the space of one switch, you can have as many as eight mini-switches, each capable of controlling several lights. They typically cost from $50 to $100. The Leviton Maestro, which can control every light in your house, sells for $500.



X10'S ACTIVEHOME software lets you control connected appliances from your PC.

It's clear that PCs will play a bigger role in controlling and automating homes and in pushing automation technologies forward (and prices down). Universal Plug and Play (UPnP) is the likely umbrella technology that will unite the security, lighting, and audio-video factions. Both Windows Me and XP support UPnP and a handful of devices—including network adapters and routers—have shipped, but it's still a trickle. Specifications for home automation devices such as light switches were only published in late 2003. Unfortunately, little will be retrofittable, so you'll need new appliances to make all the parts work. If you have a dozen X10 wall switches controlling your lights now, you won't have to replace them, but you will need a new UPnP-aware X10 control box.

If you're ready to take the plunge, make an initial investment now and leave room for incremental improvements as the technology evolves and prices drop.

Bill Howard is a contributing editor of PC Magazine.

BILL HOWARD

On Technology

No Cords, No Hassles

Cordless keyboards are nice to have, but cordless mice are essential.

Wireless begets wireless. Once you cut the cord on a couple of devices, you want to cut them all. Aren't you glad your TV set no longer has a wired remote? Wouldn't life be simpler if your surround-sound speakers didn't require you to snake a pair of cords back to the AV receiver? Here are half a dozen wireless technologies you'll want to take advantage of.

For home automation and control, a wireless protocol called Z-Wave from Zensys (*www.zen-sys.com*) has a good chance of coexisting with and possibly supplanting the X10 protocol. (See my story on X10 home automation on page 58.) X10 reacts to pulses sent over power lines, and with 25 years of refinement, it has been improved but not perfected. Z-Wave operates on a 908.42-MHz radio frequency, just above that of cordless phones, and it hops from device to device and back to the host controller, which can be a handheld remote or a PC. Unlike X10, all Z-Wave devices are two-way, meaning they can report back that they're on. Wall switch and appliance modules cost about $30 to $50, roughly the same as Leviton X10 or X10 Pro modules. Some PC-based X10 software, such as HomeSeer, lets you control X10 and Z-Wave devices simultaneously. Z-Wave is also compliant with the emerging Universal Plug and Play (UPnP) standard.

In a bachelor pad or in the family room, controller cords running from your sofa to your PlayStation 2 or Xbox are an eyesore, unless you put them away after each use. For a little more than the price of your next game, you can switch to a wireless controller, such as the Logitech Cordless Controller ($59.95 direct), with versions for the PlayStation, PlayStation 2, Xbox, and PC. It's just like a regular controller only a bit bigger, but most users quickly adapt. Or you can plug two wired controllers into the Saitek WOW Wireless Adapter ($40), which is PlayStation-only.

Cordless keyboards are nice to have, but cordless mice are essential, because mouse cords can snag and (unless they're incredibly thin and supple) resist your movements. I'm partial to Logitech because one of its keyboard-and-mouse sets is also a Bluetooth hub, and the keyboard on some Microsoft packages is split (probably better ergonomically, but I'm not going to retrain my hands). On the others, the function keys are clumped in groups of three when everyone else uses four. Look for the lightest mouse you can get, closer to 4 ounces than 8, and don't worry about battery life.

Self-powered, audiophile-quality Wi-Fi loudspeakers are coming. At the recent Consumer Electronics Show, automation control start-up OpenPeak showed music streaming to loudspeakers via wireless Ethernet as part of its effort to simplify AV and home control. (Ethernet-to-IR converters make your Pocket PC into a whole-house remote.) Wi-Fi speakers mean you no longer have to wire individual rooms (at $200 to $500 per room) for whole-house audio or snake wires under the rug for rear surround sound. You could even have portable players pulling music off your PC's hard drive, as Linksys has announced. There are some obstacles to Wi-Fi if you send left- and right-channel information independently and the packets arrive out of sequence; a difference of a few milliseconds is deadly to the left and right surround sound.

Cordless headsets for traditional and cellular phones are great if you make a lot of calls and can amortize the cost over a lot of calling minutes. I was impressed by a prototype of the GN Netcom 6210, a Bluetooth device that works with Bluetooth cell phones and (with an adapter) traditional phones. But it costs $299 (list), while a decent corded earpiece from Jabra runs one-tenth of that price.

NextGen City is rolling out public trials of MeshNetworks' vehicle-to-vehicle communications technology in the Dallas suburb of Garland late this winter. MeshNetworks' technology lets an industrial-strength variant of Wi-Fi hop from car to car, from cars to access points on light poles and buildings, and from there back to the Internet. (See Pipeline, page 19.) Like Wi-Fi or the coming Wi-Max (long distance mobile Wi-Fi), the MeshNetworks system handles Internet traffic wirelessly, but it's not directly compatible.

The 500 access points in the 60-square-mile city of Garland are for public-safety vehicles, but they could extend to private vehicles and homes. If and when MeshNetworks succeeds, you'll have two-way Internet access in your car—video, traffic warnings, and even emergency locator without a GPS receiver.

MORE ON THE WEB: *You can contact Bill Howard directly at* bill_howard@ziffdavis.com. *For more On Technology columns, go to* **www.pcmag.com/howard.**