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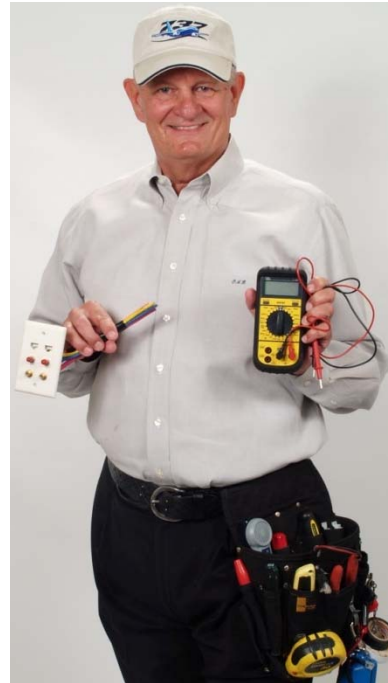
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Glenn A. Bell

Home Automation On-Line

About the Author



I want to emphasize right in the beginning of my message that the sole purpose of this eBook is to open your eyes to the real lifestyle improvements that proven electronic systems can bring to your new or remodeled home. These improvements range from green energy savings utilizing control of lighting and HVAC, to whole-house entertainment, to data handling capabilities.

My name is **Glenn A. Bell**. I am the President and founder of **American Industries Corp.** We are a licensed and insured security company operating in Honolulu, Hawaii, since 1998. We design and install the latest in integrated electronic systems for both the residential and commercial market. See our Contracting site at www.aicorp.net for reference.

I am starting a new chapter in my life called "semi-retirement", yet I sincerely want to help other people install modern technologies into their new or retrofitted homes. With my knowledge and many years of experience, I have written this book to help people understand the variables of Modern Home Electronics.

"How can this benefit me" you ask? What I have to offer can benefit you in one of three ways. The **first reason** you should read my books is that by doing so you would be well on your way to become a qualified technology installer. You could in fact, work towards becoming a Contractor yourself or perhaps work as an installer for a Contractor building your experience.

The **second, and most promising reason** you should read my books, is that you could install the technologies in your house yourself, therefore saving thousands of dollars. Depending on the type and sheer volume of electronic systems you want for your home, it will cost you anywhere from \$20,000 to \$100,000 to have a contractor do it for you. In addition, depending on the contractor you come in contact with, many times he will try to package various technologies together. You end up paying for systems you really could have done without.

The **third benefit** is that by reading my *How to Install* eBooks, you can be fluent enough in the language of electronics for homes, that you could negotiate with a local Low-Voltage Contractor in your area to have the technologies you want installed in your home at a more reasonable price point.

So what I am offering is an opportunity for you to have a full 100% understanding of each system so that you can install it yourself. You will understand the overall concept, wiring diagrams, connector diagrams, equipment components, special tools needed, and programming required. Once you are ready to install, my ebooks will take you from one step to another. When I say you can do the installation, I don't necessarily mean that you personally have to do the work. You could be an 85 year old grandmother and carry out the installation by having family members pitch in or hiring someone at a few dollars per hour. The physical work is not really too strenuous and its fun.

In this eBook I hope to provide a brief description of the various technologies, which can improve your home in four areas; security, whole house entertainment, energy management, and data transfer. In my contracting business, we have been successful

in integrating these various technologies through the use of automation into a **"total comprehensive system"**. In addition, we have been able to document and publish each phase of the process so that we can teach anyone how to plan and install a custom designed system in his or her home. No, you do not need to be a computer whiz or a technically astute person to apply what you will learn in my books.

All of the technically complicated parts of each system have already been designed and tested. All you have to do is select the capability you desire or that your budget will allow. The computer programming is all windows based so that you simply point and click to get the results you want. All you have to do is install the structured wiring cabling, outlets, receptacles, distribution panel, controlled switches, equipment racks etc., or have someone do the labor for you.

When you purchase one of my **How To eBooks**, you are not just buying a book, you are **purchasing a standard package** providing these items:

- ✓ Complete word by word explanation of the installation
- ✓ Wiring descriptions and diagrams
- ✓ Required special tools list
- ✓ Required equipment components
- ✓ Unlimited email support (as long as you follow the directions)
- ✓ How & What to Purchase
- ✓ One on one time with me on the telephone at a discounted rate, guiding you through the installation

If and when you purchase a system to install you will get:

- ✓ Programming Software
- ✓ Installation Manuals
- ✓ Owner's Manuals

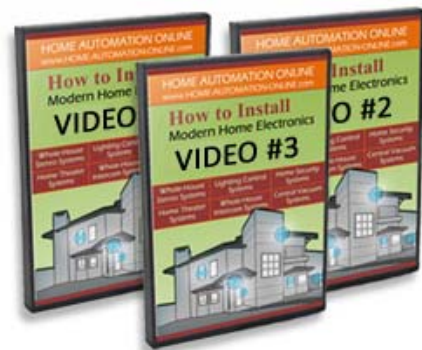
The problem with many training courses, and there are some good ones out there, is that their focus is limited to a generalized subject. My books are different because I will give you installation instruction on specific systems.

My eBooks will:

- ✓ Give you instructions on designing and laying out each system as they relate to your building plans
- ✓ Help you negotiate with your Building Contractor and Electrician as they relate to our systems
- ✓ Point out the do's and don'ts along the way

So now, read my entire book, or utilize the built-in Table of Contents capability by Adobe® by clicking in the left hand column of this document. In each chapter about a particular technology system, you can click on a link which will take you directly to my website for a description of each of my How to Install eBooks.

FREE
10 Video Mini Course
on How to Install
Electronics in Homes



Click on this link:

<http://www.home-automation-online.com/blog/10-free-video-mini-course/>

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Chapter I: Whole-House Structured Wiring Distribution

Whether you are building or having a Contractor build a new home for you, or you would like to bring your existing home into the new century, whole-house distribution wiring is the key. If done correctly, you and your family members will have individual audio/visual, data ports, telephone ports, and remote control throughout the home. Let me emphasize from the outset that this technology increases the value of the home far in excess of the \$\$\$ required to install it. And you don't even want to think about trying to sell the home in five to ten years if it does not include this technology.

Residential "**structured wiring**" is a minimum standardized infrastructure of cables installed during home construction or as a retrofit to existing homes. These cables are designed to distribute a wide range of existing and new telecommunications, data, and audio/video applications throughout the home, linking devices in the home from computers to satellite receivers with new and future wide bandwidth services outside the home.

Proper whole-house wiring has become an absolute necessity as it provides the pathway by which homeowners will access information today and in the future. Whole-house systems can include many technologies including: security, home theater, multi-room audio/video, home automation, telephone/data communications, computer networking, surveillance and access control. In order to allow for easy implementation of each technology over time, a home

must be properly (*structurally*) wired from the start. The home's structured wiring system is the foundation for future technologies.

Click on this link for a video presentation by Honeywell®:

Give the presentation a few moments to load.

<http://www.security.honeywell.com/hsc/solutions/structured/demo/HouseLoop.swf>

Depending on one's desires for capability in each room, now and in the future, one would run various types of cabling from a given bedroom, office, kitchen, or living room from connecting wall outlets to a central distribution panel. This distribution panel would typically be physically located somewhere toward the center of the home to keep wiring runs to a minimum length. Telephone and data communications enter the home at the distribution panel and are fed out to each room in a "**Home Run**" arrangement.

A Home-Run residential wiring design is desirable for two reasons:

1. A home-run system is desirable because it is much easier to trouble shoot when and if a problem occurs. With a home run architecture, each component and location can be isolated and checked individually.
2. In a home-run system, it is very easy to change the purpose of a particular cable from a telephone line to an extra computer port, a video entertainment port to a surveillance camera port, etc.

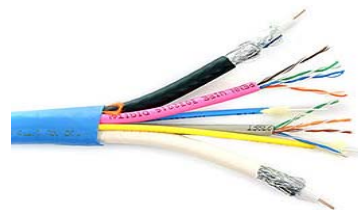
The potential beneficial scenarios are endless. The fact is, that a home run system offers more convenience, greater flexible and future ready infrastructure for tomorrow's technology. And because of the open and flexible architecture a homeowner will actually save many hundreds or even thousands of dollars over the life of their home.

With a home run system it is easy to provide system changes and/or upgrades. For example: When a home owner decides to add a satellite system, the installer has direct access to each location for the inclusion of diplexers and for adding a satellite multi-switch that provides multiple receiver locations from one 18-inch dish. Or maybe the homeowner decides to convert a bedroom into an office.

Today's electronic equipment and services are vastly different from those offered ten years ago. With the introduction of home offices, computers, home theaters, digital satellite dishes, the Internet, the World Wide Web and similar types of equipment and services, the "typical" wiring in a home has become over loaded and out dated. The Home Network, utilizing **Structured Wiring**, is the perfect way to control and share information from these types of electronics and services as well as providing you with the peace of mind that comes from knowing that your Home Network will accommodate future technologies and services.

The Distribution Panel is the perfect way to manage and control which rooms in your home receive which signals. Incoming signals from the TV or Telephone Company are routed to the Distribution Panel and connected at the Service Input Hub. The wiring from each receptacle in the house is routed back to the Distribution Panel and connected to one of the rows in the Patch Port Area. The row is then labeled to identify from which room the cable originated. Homeowners can then control which signals (TV, Cable TV, telephone, fax, etc.) go to which room by simply using a patch cord to connect the incoming signal to the desired room.

Because the Home Network will FutureProof your home with **Fiber Optic Cable**, you'll be ready for almost any technology coming your way in the years to come.





Home Office

I have a simple solution for those wanting to connect multiple computers and printers. With a Cable Modem and Internet Router or Ethernet Hub, computers from several different rooms are linked together so they can share information, play games, or access each other's hardware (CD-rom drive, DVD drives etc.). High-speed Internet access will now be available in multiple rooms. The modem, router, and/or Ethernet Hub mount directly into the **Structured Wiring Distribution Panel**. Connecting a new computer to the network, or changing the location of existing computers is as simple as changing a patch cord.

Computer Networking

A web safe router provides these features:

- Protects against hackers gaining access to your computers
- Provides your own LAN network; computers, printers, faxes communicate
- Provides high-speed Internet to multiple computers at same time
- Parents have full control over sites children surf

Home Entertainment

Wouldn't you love to use the stereo receiver, CD player and tuner from your current stereo system or home theater to create whole house sound? How about watching DVD movies or cable TV on any TV in your home? With a **Video Distribution Hub**, you can.



Whole-House Stereo

If you want background music in your kitchen, entryway, office, or any other location in your home, there's no easier way to do it than with an **Audio Distribution Hub**. The Audio Distribution Hub mounts directly into the **Distribution Panel** and provides stereo sound to 8 locations. The Audio Distribution Hub uses your existing stereo receiver, CD, and tuner, which mean you don't have to buy extra equipment.

If you want each individual room to be able to select different sources of audio at the same time, that involves purchasing and installing a **Multiple Source, Multiple Zone Whole-House Stereo system**. We have an excellent system that integrates with the security / home automation controller.



Front Door Intercom

By installing the Front Door Intercom Hub in your distribution panel, you will have communication with visitors at your front door. If required, you can also install an electronic door lock release allowing for the door to be unlocked by telephone from any phone (including cordless phone by the pool). Of course, if you have a Video Surveillance System in your home, which will be discussed later in this book, you could be viewing the visitor on a camera prior to pressing the door lock release button.

**For more information on how to wire your home with a
Structured Wiring System, Visit my website:**

www.home-automation-online.com

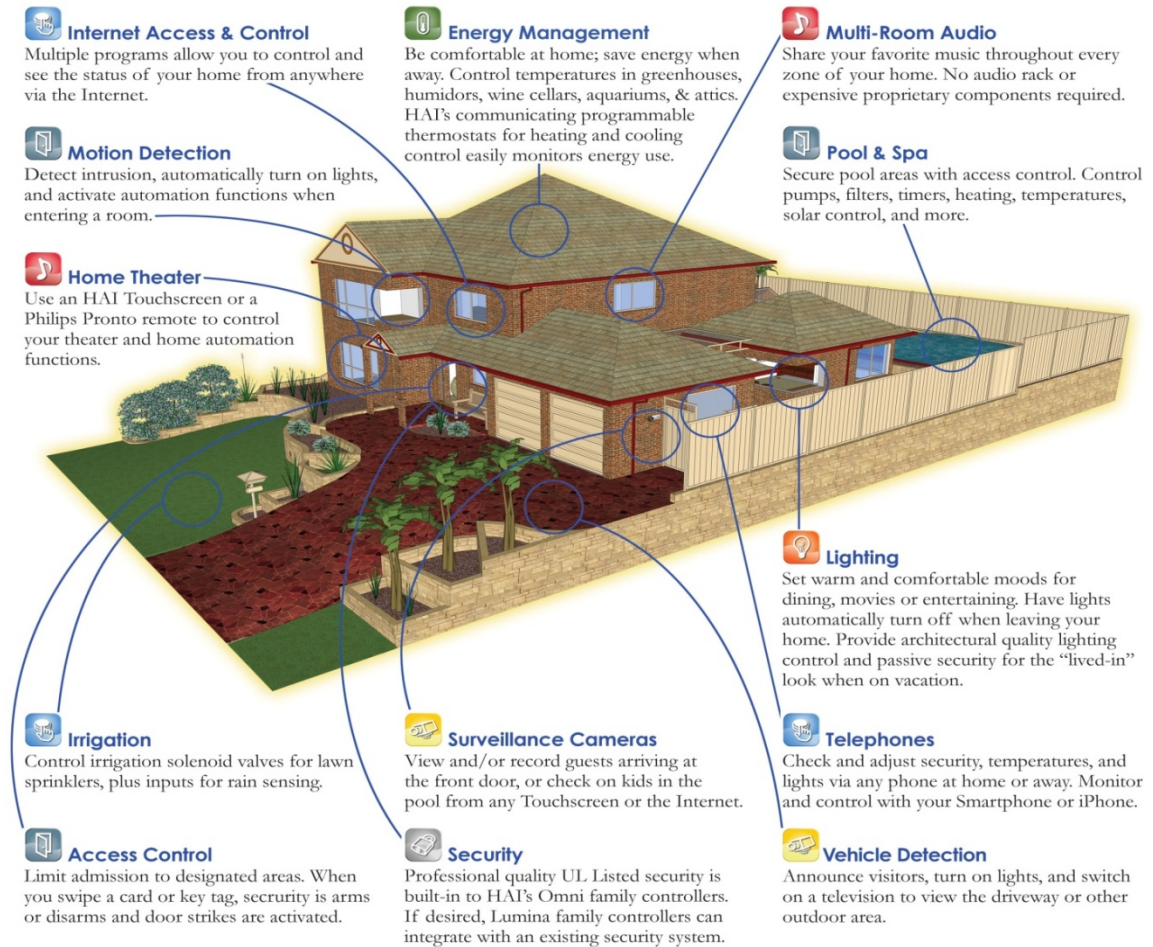


Chapter II: Security / Home Automation

Home Automation refers to an intelligent home, which is controlled by a 2-way interface computer. Without conscious thought by any human, it manages the systems in your home to provide you and your family with the ultimate in luxury, convenience, safety, security, substantial energy savings, and peace of mind. Automation makes it possible to integrate various technologies into one cohesive system. An automated home adjusts the security, cooling, heating, and lighting automatically for comfort, energy savings, and convenience. A home automation system takes the place of a standard security system, and for not much more, greatly increases the value, safety, and efficiency of your home.

Systems can be accessed and controlled over the telephone, either from within or away from home, and over the Internet. Check and adjust lights, temperature, and security from your phone and/or computer. Not only can you call into your system to check on the status of your home over the telephone, but your system can actually contact you! The system can be programmed very easily to call out over the phone to inform you when your children have arrived home from school or if the alarm has gone off.

You can expand and customize your home automation system. Not everyone wants the same capabilities in their Security/Home Automation system. I will inform you of what I consider to be a basic system with several capabilities. However, I will also spell out in detail other capabilities which are routinely included in a modern home.



Basic System

You will have a **UL Approved security system** with more capabilities than a standard security system. The system is designed for simplicity for family members. Most of the automated control occurs just by the simple act of arming, disarming, selecting the Away, Night, or Off mode on your security system.



When in the ALARM mode, it communicates with an outside monitoring station. It can call you on your cell phone in lieu of, **or in addition to** the security monitoring company.



Telephone control from any phone in the world



Internet Access and control from anywhere in the world.



Integrates Whole-House Lighting (if lighting system installed)



View cameras in-house on **touch screens**, on the **Internet** from any computer, and on **hand held cell phones** with Internet connectivity.



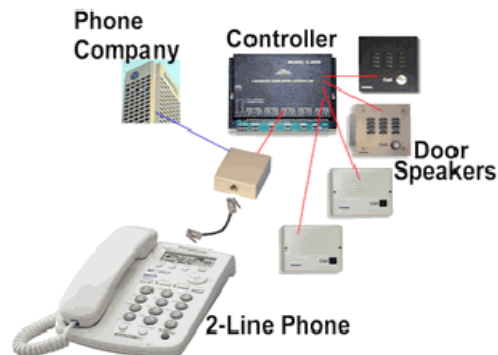
Access Control

- Use small access cards or keychain tags instead of keys to enter home
- Each family member has a unique keychain tag which when used runs program
- When family member enters door a program adjust lights, temperature, & audio
- Can be easily programmed to automatically ARM & DISARM security system



Whole-House Stereo systems

- Integrates two different systems at two different price points.
- Six-source, eight-zone (expandable to sixteen zones)
- Control from touch screens



Integrates Whole-House Intercom

For more information on how to install your
Security/Home Automation system, Visit my website:

www.home-automation-online.com



Chapter III: Whole House Lighting Control

Click on this link to get a visual demonstration of lighting control.

<http://www.centralite.com/company/lightingControlExperience.asp>

There are basically three types of premier Architectural Lighting Systems available. The first is a hard-wired system. The second type is an electrical grid system whereas the third is a wireless system. In addition to the following list of features, these systems actually save on energy cost. They do that by automatically turning off lights and turning lights on at preset dimmed levels of your choosing. **Example:** A dimmed level of 90% is virtually indistinguishable from full on, yet saves 10% energy. If set at 80% illumination, energy savings is 20%. Lights set at 50% illumination save 50% energy. Now multiply this energy savings by your entire house.

Once the system is in place, you will determine the properties of each light load:

Illumination

Enjoy a softer light level by choosing between 1 and 100% illumination.

Ramp-Up Rate:

Instead of lights snapping on to 100%...you choose the rate at which they turn on from 0 to whatever level you want for each light load.

Fade-Down Rate:

When you turn lights off, they will fade off at whatever level you choose for each light load. We program each button to toggle your choice of lighting scenes On & Off.

Lighting Scenes

You can have as many lighting scenes as you want. If you can think of a lighting scene, it can be programmed once the system is in place. Lighting scenes allow you to push one button and control any or all the lights in your system. In a lighting scene some lights can be made to turn on and some lights can be made to turn off. Lighting scenes allow you to choose the illumination level, ramp-up, and fade-down properties of each light load separate from the individual properties of the light loads.

Standard Scenes:

Dining, Entertainment, Good Night, Good Morning, Pathway Lighting, Landscape, Exterior, All On, All Off, Security, etc. Let's take pathway lighting as an example. You have a lighting scene which turns on your driveway sconces, exterior stairway, front porch light, and various lights throughout your house to your bedroom. When you get to your bedroom, all of those other lights go out automatically. How about a pathway scene that gets you from your bedroom to the kitchen and back by touching just one button?

Most systems are purchased and installed in 12-load increments starting at 24 Loads. As the need for additional loads increases, so does the size of the controllers and other required electronic equipment. There are larger systems available with handling capabilities of 24, 36, 48, and 60 load systems.

Example: When you turn a switch on and a single light turns on; that is a light load. If on the other hand if you switch a light switch to the "On" position and turn on several lights at one time, that would mean the lights have been "daisy chained" by the Electrician. All those lights would be considered **just one light load**.



The **Electrical Grid System** also has credit card size **Remote Six Button Controllers** for each of your in-wall 6-button controllers. It utilizes infrared which allows you to sit in your easy chair in the living room, point it at your In-Wall 6-button controller, and command any of your lighting scenes.



You can also control your lighting scenes from any of the touch screens. I can show you how to install this lighting control system and integrate it with the **Security / Home Automation** system.

**For more information on how to install your
Architectural Lighting Control system, Visit my website:**

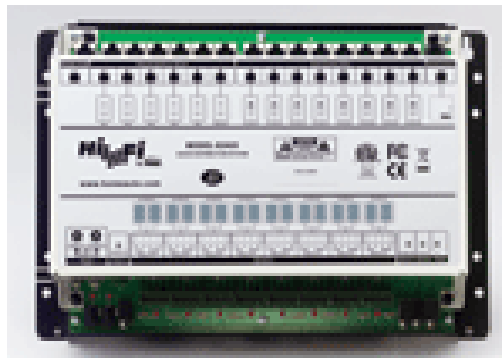
www.home-automation-online.com



Chapter IV: Whole House

Multi-Source, Multi-Room Stereo

A Multi-Room, Multi-Source Stereo system provides everything you ever dreamed of in a whole-house stereo distribution system. It will deliver stereo music throughout your home, plus every member of the family can listen to something different and the volume level each desires. VERY COOL!



What is a Whole-House stereo system that has multiple sources and multiple zones? Each occupant in each room of the house with a wall-mounted controller can turn his/her music on/off independent of occupants in other rooms. Mom can listen to classical music in the kitchen, Dad can listen to jazz in his office, and each of the kids can select hard rock or pop music in their rooms all at the same time. Each occupant in each room selects their own volume level. There are up to six sources which can be feed into the system. **A typical setup would be:**

- Audio from cable TV
- Audio from AM/FM Receiver
- Audio from CD or DVD player
- Audio from DVD player
- Audio from Ipod®
- Any other music source



A Whole-House Stereo System is comprised of these components:

- An electronic unit that contains 8 individual amplifiers within one chassis
- Individual wall-mounted controllers in multiple rooms (zones)
- Category 5 control cable from keypads to the main unit
- Quality 16-gauge speaker cable from the main unit to stereo speakers in each room
- Category 5 control cable from main unit to the Security / Home Automation controller
- Optional color touch screens (when home automation controller part of system)

The system provides information such as play list, channel name, artist name, and song title. And it supports custom presets, music themes, and source names for a personal touch. You can set bass, treble, balance and loudness levels from each room. Turn the entire system on or off from any keypad.

Use your iPod® as a Source: Now you listen to all the music stored on your iPod® through ceiling speakers. When connected to a multi-room, stereo system, an iPod® becomes a music source for the entire household. Utilizing the communication platform users can select music from the iPod's music library as if they had the iPod® in their hands. Navigation and choosing music is as easy as a touch of a button. Select by play list, genre, artist, album, or song title. As music is playing, information (metadata) appears on the touch screens adding extra enjoyment.



Both the eight and sixteen zone system integrate with the **Security / Home Automation** system. To control a music zone from the touch screen one need only to touch the music note icon on the bottom far right position.

You can add a Music Server which opens up your music collection to the rest of your home. A music server/renderer with three independent stereo channels, uses a Touch screen for selecting music from anywhere in the house.

Selections can be made by artist, title, genre, or playlist. Album art and other meta-data can even be viewed. Where a multi-room audio system is available, the Music Server can be fully integrated. Use existing playlists, or create new ones on the fly. Simply push the "+" button to add a song to your new playlist.

**For more information on how to install your
Whole-House Stereo system, Visit my website:**

www.home-automation-online.com



Chapter V: Surveillance / Lifestyle Video

There was a time when these systems were only referred to as **security surveillance systems**. That time has long since passed as many of a home's cameras are focused in on locations dealing only with family matters. A few examples of those types of locations are:

- Front gate or front door
- Swimming pool area
- Babies room
- Family room area
- Back yard around the BBQ pit

So now a typical system has cameras focused in on areas of security while other cameras are there solely to enhance the family lifestyle. In any case the technology today is state-of-the-art and very reliable. In fact, the images from all the cameras at one time, or one camera image full screen are available on a local monitor, local computer monitor, or any computer monitor in the world.

In addition, the typical system these days is recording twenty four hours a day, seven days a week. Each camera's images are recorded every second, or to save on hard drive space some are set in a motion detection mode. In other words, when armed in this mode, the images are not being recorded except in the case of movement where movement is not expected. A good example of that would be an infrared camera in the garage. During the night no movement is expected in the garage. If and when the camera picks up movement the images are recorded for a specified amount of time.



There are several camera manufacturers producing commercial grade dome cameras. They are all fairly equal in quality and reliability as long as they have at least these basic capabilities:

- Rugged vandal resistant construction (can hit with a baseball bat)
- Weatherproof (keeps moisture, dust, and insects out of camera)
- At least 500 lines of resolution (HD cameras are over 1000 lines)
- Digital Noise Reduction (DNR)
- Built-In ground fault isolation transformer
- Virtually "0" Lux (Able to see in complete darkness)
- Infrared LEDs
- Auto iris (automatically adjust for varying light levels)
- Variable focus (able to focus from a few feet then out to infinity)



Summary

The quality series DVRs are designed to achieve CIF quality of real time recording and playback @ 240IPS high quality recording for any demanding security application.

The free user-friendly client software of the DVRs, gives the convenience of high definition video display and control over the entire video system. The dual codec

function also comes into play with this new series and allows the user to record live video onto a hard drive while reviewing the previously recorded images without compromising on speed.

Other outstanding features are; built in DVD-RW option, 500GB SATA HDD standard with the maximum of 6X 1TB HDD capacity, web based monitoring & search, simultaneous BNC output, VGA/BNC output and HDMI.

Features

- Standard MPEG-4 compression
- Rec. Real-time on 8 cameras: 240ips (NTSC)
- Built in internal DVD R/W option
- Simultaneous recording & transmission: dual codec function
- Support POS (I/F VSI - pro) (option)
- Web based monitoring & search
- Simultaneous BNC output & VGA / BNC output & HDMI
- Stable system operation: remote diagnosis function

**For more information on how to install your
Security / Lifestyle Video Surveillance system,**

Visit my website:

www.home-automation-online.com



Chapter VI: Whole House Intercom

There many types of systems manufactured by multiple companies. In my **How to Install Whole-House Intercom** eBook I discuss at length two specific systems. The two systems represent two distinct technologies. The first system is a relatively simple system with limited capabilities and modest price point. The second is a much more capable system with lots of features which is reflected in the cost of the system.

The first system was discussed briefly in the Structured Wiring section of his book. I have installed many of these systems with ease. The first thing you have to realize about this particular technology is that it is only a Whole-House system because everybody can answer an incoming call from anywhere in the house on any telephone. That would of course include cordless phones in the back yard next to the pool.

This particular system would be more aptly named a **Front Door Intercom** system. The equipment can be purchased and installed with these options:

- **Front Door Intercom station communicating with the whole-house**
- **Front Door Intercom and Back Door Intercom**
- **Front Door Intercom and Front Gate Intercom**
- **An electronic door lock release**

The second type of system is a true whole-house intercom system and so much more. In fact, in all the years that I have been installing this particular system, I nor my clients have used more than about 50% of its capabilities. This technology is two systems in one.

The first feature you get is the ability to answer the phone anywhere in the house, and if the call is for Dad and not you, just transfer the call like you would in a business. That feature alone is worth the price of admission, especially in large or two story homes.

The second feature is the ability to converse with any room of the house over the phone. To have whole-house intercom is very easy, because when you pick up the receiver or touch the speaker button on any phone in the house, the tone you hear immediately is the intercom tone. All you do is touch a three digit number for the room you want to reach. The sequence is not something elaborate, you simply run down the list from 101 to 108.

That is what you get with the basic system which is quite a bit. That basic system will handle three incoming phone lines to your home and deliver those phone lines to eight different rooms. If you like you can purchase additional electronic components that install within the main unit that expand the capability to a total of sixteen phones in rooms scattered throughout your house.

In addition, there is an electronic component which will give you the ability to:

- Talk to visitors at the front gate or front door
- Electronically unlock the front door or front gate

For more information on how to install your

Whole-House Intercom system,

Visit my website:

www.home-automation-online.com

Chapter VII: Home Theater Wiring

I usually wire for a 7.1 system even though many of my clients over the years are perfectly happy with a 5.1 capability. That way just in case my customer upgrades at the last minute to a bigger system, I have all the bases covered. You might consider doing the same.



Experience A Home Theater

Isn't it time you experienced DVDs and TV programs the way they were intended - in high definition with surround sound? Our dedicated home theater installations with custom programmed remote controls ensure all the features of an intense theater rig are right at your fingertips. Immerse yourself in Dolby Digital, DTS, and THX

audio formats and feel the rumble of King Kong wrestling with the ferocious T-Rex. Surround sound will take you far away from your current TV's puny speakers and place you right in the middle of the action - just like at the movies.

Education

A home theater system is almost always comprised of either a 5.1 or a 7.1 setup. The "5" refers to the number of speakers and the ".1" refers to the inclusion of a subwoofer. A speaker is commonly placed at each side of the TV. One speaker goes directly above or below the TV and the last two speakers are placed at either side of the listener. Speakers can be mounted to the wall or else are installed flush with the ceilings or walls. The subwoofer is placed on the floor, inside a wall, or inside a cabinet to accurately produce lower frequency sounds. In a 7.1 configuration, two additional speakers are placed behind the listener.



The exact placement of the speakers is ultimately determined by the room layout and its acoustical properties to create a compromised balance between form (appearance) and function (performance). DVD players, cable boxes, and the remaining equipment can be placed within a custom A/V rack, exposed on a shelving unit, or tucked away inside custom cabinetry. Fans may be added to help keep the components properly ventilated. Exceptional theater systems include a custom programmed remote to operate all the bells and whistles of your system. Finally, comprehensive surge protection ensures all your equipment is safe when a power spike occurs.

**For more information on how to install your
Home Theater Wiring , Visit my website:**

www.home-automation-online.com



Chapter VIII: Central Vacuum System

It is true that Central Vacuum has nothing to do with all the other glamorous technologies. However, it is a low-voltage control technology so I started installing it for my clients years ago because of the demand. You should consider installing this relatively simple system because it makes life so easy.

This Central Vacuum System can make cleaning your entire home easier and less time consuming while making it a healthier place to live. The power unit is installed in the garage so you don't have to carry the motor, filtration system or dust collection cup. Instead, you will have a lightweight hose to easily maneuver through the house.

The powerful electric brush goes from carpet to hard floors with no adjustments and features an ergonomic handle, telescoping wand height and full swivel hose. Versatile attachments make cleaning upholstery, drapery and even delicate fabrics practically effortless.

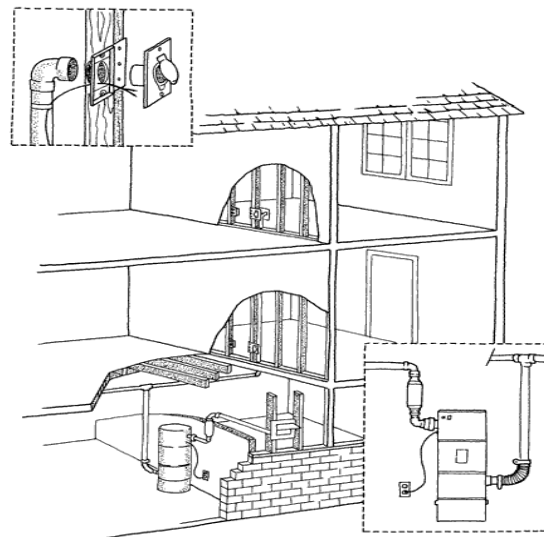


Clinical research has shown that the use of a central vacuum system can relieve major allergy symptoms. This system is the only central vacuum system with true HEPA filtration that reduces 100% of contacted dust and allergens from the air. Simply tap or rinse the filter with water once every three years to keep it

working like new. In addition, with the power unit and dust collection cup are located outside of your home, the dirt is completely removed from the living area.

The power unit is located away from living areas so that noise levels are significantly reduced. The unit also has an innovative, sound absorbing design that reduces the noise level of the vacuum. It produces only half the noise level of other central vacuum systems.

The electric power head is extremely quiet with cogged-belt direct drive that automatically adjusts to clean bare floors and any carpet or rug within your home. It is designed with a scratch and rust resistant body that is virtually indestructible. In addition, the 520 air watts motor is up to five times more powerful than conventional vacuums so cleaning your home requires less time.



The basic installation involves mounting the main unit down in the garage or basement. You would calculate the number and locations of vacuum connection ports by separating them approximately 45 feet on each floor. The standard hose is 30 feet long so it can vacuum in either direction from its location.



The device pictured here is called a Vacuum Pan. It is typically installed under a cabinet in the kitchen. After you sweep up debris from the kitchen floor, you simply push the lever on the Vacuum Pan with your toe which makes a low-voltage connection to turn the main unit on down in the garage or basement. It is a little tricky to install, however I have installed many of them and will lead you through the pitfalls step by step.

**For more information on how to install your
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