RockridgeResidents.Org Presents:

# Security Systems 101

Thoughts from a user who's put
in his own system

# Agenda

- ☐ Introductions
- ☐ Goal of this class
- ☐ Disclaimers (sorry, this needs to be done)
- ☐ My Background
- ☐ Security Systems Theory review(60mins)
  - ■ What is a security system ?
  - ■ Show me pictures.
  - ■ What are the options, and how do they differ?
  - ■ How hard is it to do, how long does it take?
  - ■ How much does it cost?
- ☐ Elk panel configuration software overview (15 mins)
- ☐ Appendices are for your reference afterwards
  - ■ A – Top 11 Things to remember
  - ■ B - Interesting Elk Capabilities
  - ■ C – Screenshots of the ElkRP configuration software

# Goal of this class

- Make you an educated purchaser of security systems, regardless of whether you pay someone to do it or DIY. Don't be led astray by companies trying to charge you high prices and sign long contracts unless they give you good value in return.
  - Understand the basic info about what security systems are, and what your basic options are in installing them/having them installed in your house.
  - Understand the fundamental concepts behind how security systems work, so the "magic" about them is dispelled.

# Disclaimers

- ☐ Hire a pro for the wire running and panel mounting.
  - ■ Setting up your own system is <u>not</u> something to be taken lightly, it is not like creating your own wireless network – there are fines for false alarms, and if you put in a wired system then you will need to be aware of electric code issues.
- ☐ Do your own homework.
  - ■ I am only an end user, I am not an electrician or professional installer, so I may not be doing everything correctly, you need to do homework yourself and not sue me if you have an issue.
- ☐ There are other options.
  - ■ I know the Elk so that's what I'll talk about here. But there's other viable options (ie, HAI). I don't know much about them, so I'm not going to talk about them.
- ☐ Don't try and remember everything today.
  - ■ This is not a tutorial class and I know that you will not understand and remember 100% of the content. But you should remember that "Hey, that class showed me that this was possible. I should look into that."
- ☐ This is completely "pay-it-forward" for me.
  - ■ I'm not getting any kickbacks/referral $$/forgiven fees for anything we discuss, so I don't really care which option you go with. I'm interested in getting everyone to pick <u>an</u> option, so our neighborhood is known as a hassle to break into, and hopefully the bad guys will go elsewhere.
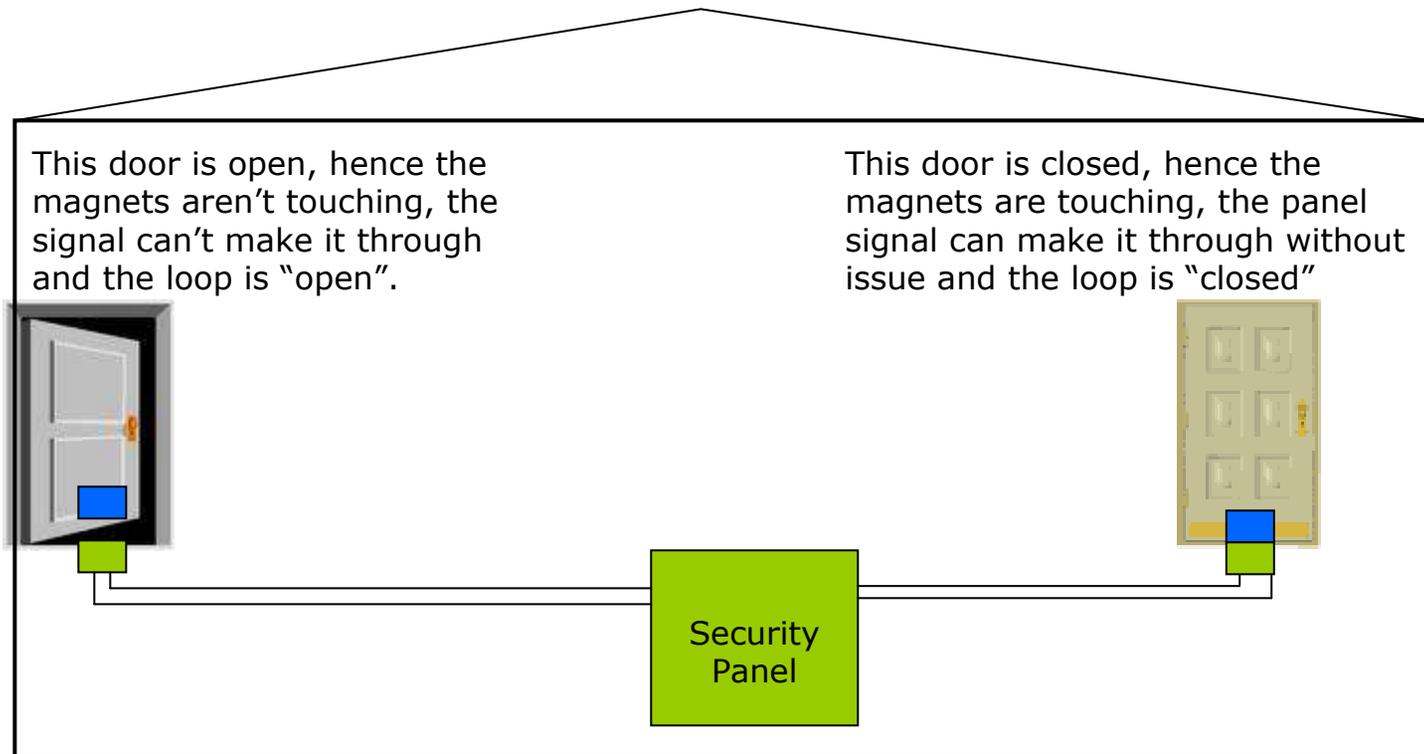
# My Background

- ☐ I am a regular consumer who knew nothing about security 14 months ago but didn't want to pay ADT $100-$150/sensor.
- ☐ I wasn't very handy when we bought our house, but mortgages in NorCal have an uncanny ability to force you to learn to be handy.
- ☐ I wanted a full security/automation system as it offers value-add's beyond ADT (I haven't done all of these yet; soon…)
  - ■ Security
    - ☐ Cheaply do every window, every door, several keypads, glass break
    - ☐ Magnetic Locks for mudroom doors, keychain keyfob's
  - ■ Notification (no alarm goes off but there is a warning indicator):
    - ☐ Driveway gate, backyard,…
  - ■ Fire/Safety
    - ☐ Carbon Monoxide, Smoke, Heat, Water Leak (hot water heater)
  - ■ Convenience
    - ☐ Temperature Sensors (see exact temperature in front yard)
  - ■ PC & Cell phone Monitoring & Control
  - ■ External Device Integration
    - ☐ Turn off lights/heat when the system is armed
    - ☐ Irrigation System Control

# What is a Security System?

◻ I'll stop and define some basic terms here as I always thought security/ADT was as close to "magic" as it got, because I had no idea what it did or how it worked. It's really very simple:

◻ It's a panel in your house that monitors sensors and notifies you and/or dials a central monitoring station based on rules you specify

  ▪ Sensors are basically simple circuits that are open or closed.
    ◻ A door/window sensor basically is an open circuit in a piece of plastic with a magnet on the other side that completes the circuit when the door or window is closed.
    ◻ A motion sensor is a closed circuit when there's no motion, and is open when there is motion.
    ◻ A panel works by sending a signal over the wire.  If the signal doesn't come back, the circuit (ie, the door) is "open". If it does come back the circuit is closed.
    ◻ Some sensors don't require power (ie, door/window are very simple circuits), some sensors do (ie, motion sensors require power to monitor an area to see if there is motion)

  ▪ Notification means the panel dials a phone # over a landline (regular phone) **_or a cell phone_**, or connects via internet (DSL connection)
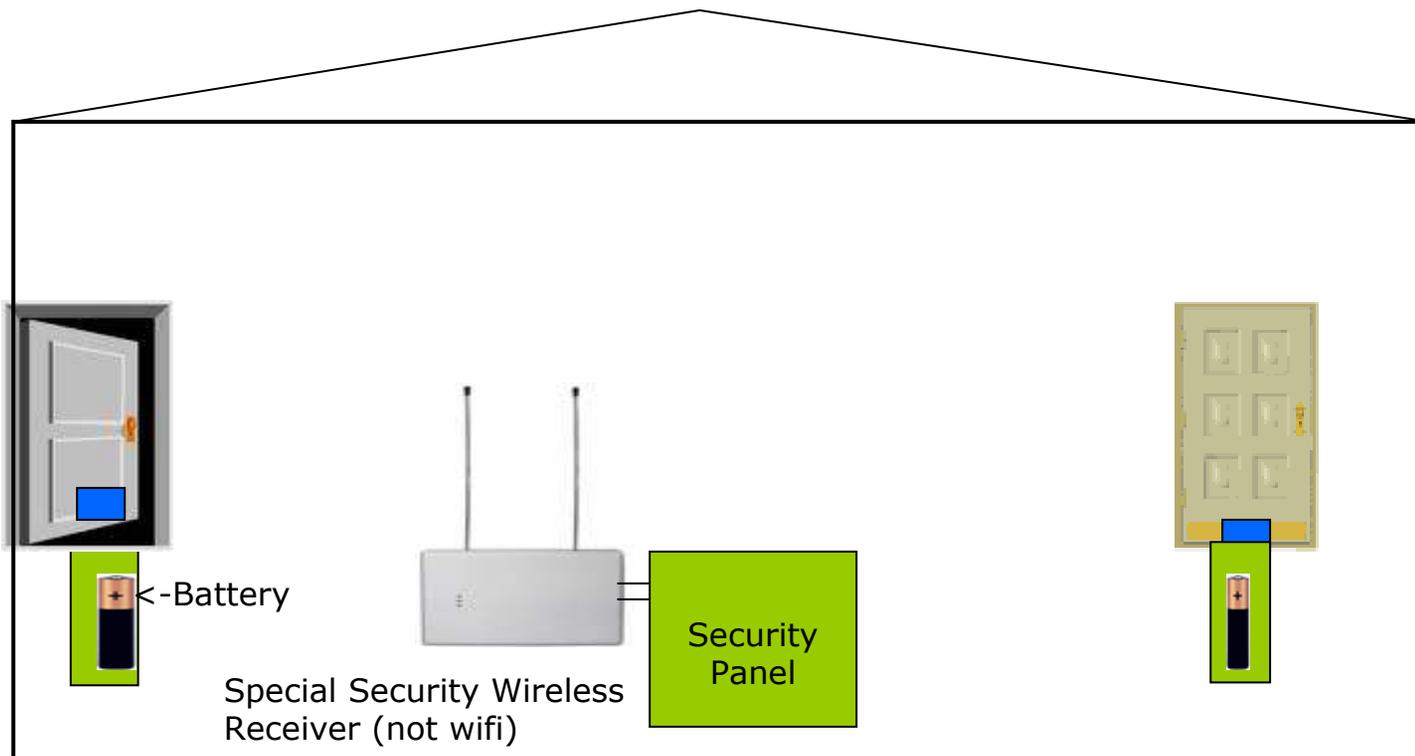
# Picture #1 – A Circuit

The circuit is the foundational concept for all security systems.

This door is open, hence the magnets aren't touching, the signal can't make it through and the loop is "open".

This door is closed, hence the magnets are touching, the panel signal can make it through without issue and the loop is "closed"

Security Panel

The security panel can tell if a door is open or closed by sending a signal through one of the wires.
If it comes back via the other end, the door is closed. If it doesn't come back, either the door is open or the wire was cut, both of which indicate a "trouble" situation.

# Picture #2 – A Wireless Circuit

A wireless sensor is basically the same as a wired sensor. It's just bigger as it has a battery and radio transmitter in it so that it can transmit status back to the base receiver.

<-Battery

Special Security Wireless
Receiver (not wifi)

Security
Panel

# Picture #3 – A Powered Circuit

Some sensors need power, and are intelligent enough to open/close the circuit based on their design

There is **no** motion in this room, So the sensor will allow the panel signal to "pass through", and the panel thinks all is ok

There **is** motion in this room, so the sensor will NOT allow the panel signal to "pass through", and the panel knows

2 wires for the "circuit"

2 wires for the "circuit"

Security Panel

2 wires for power

2 wires for power
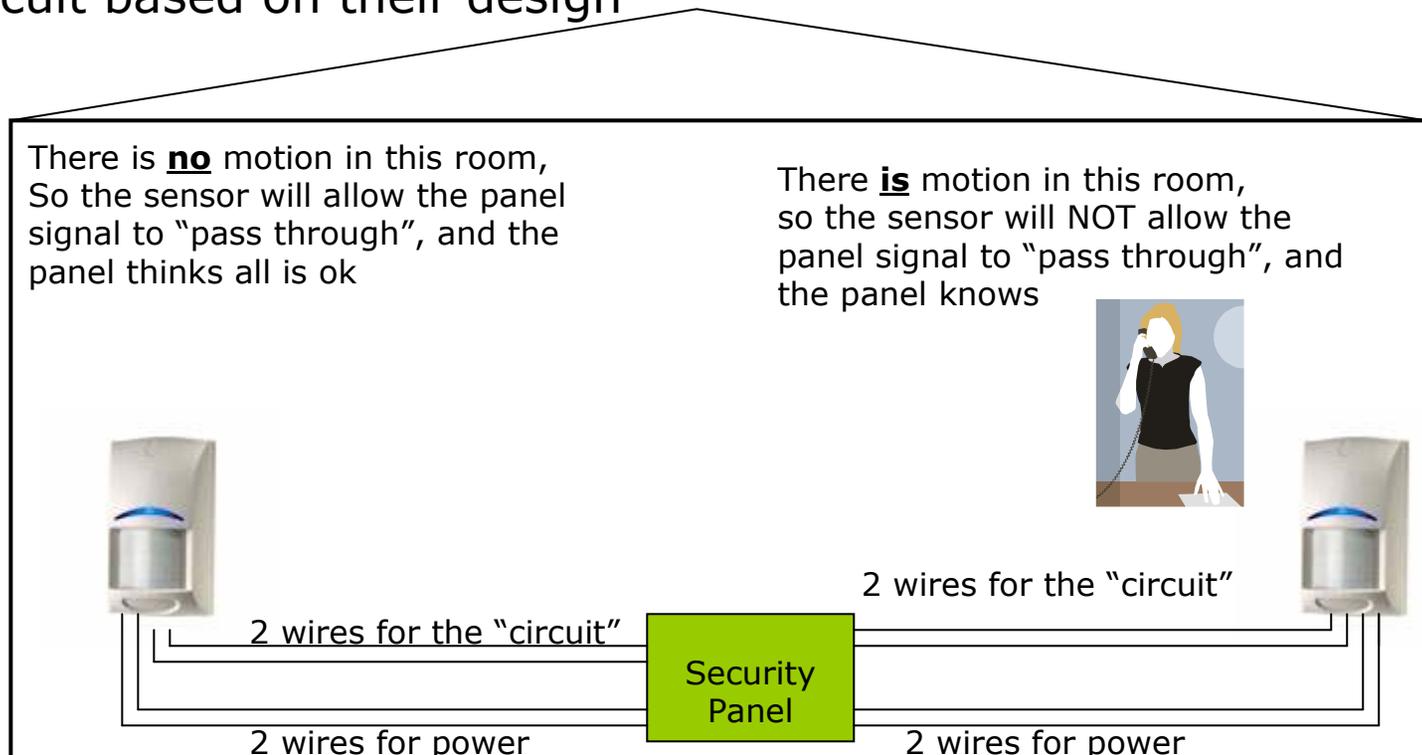
# Picture #4: Connecting to a regular phone

**No Security System**

Main Floor

Telephone Panel

Crawl Space
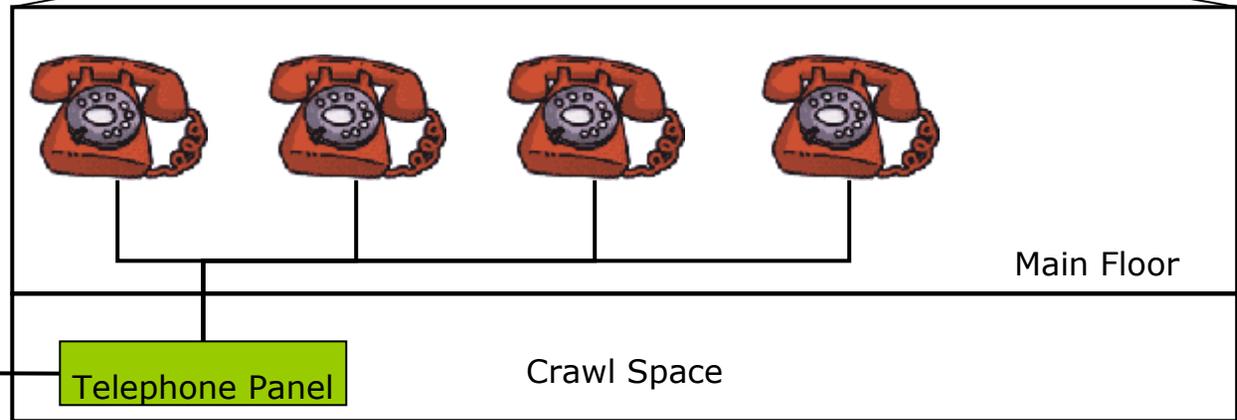
**With a security System the panel can "seize" the phone lines and make a call in case of an alarm via a *very simple* phone jack**

Security Panel

Main Floor

Crawl Space

Special Security Phone Jack (RJ31X)

Telephone Panel
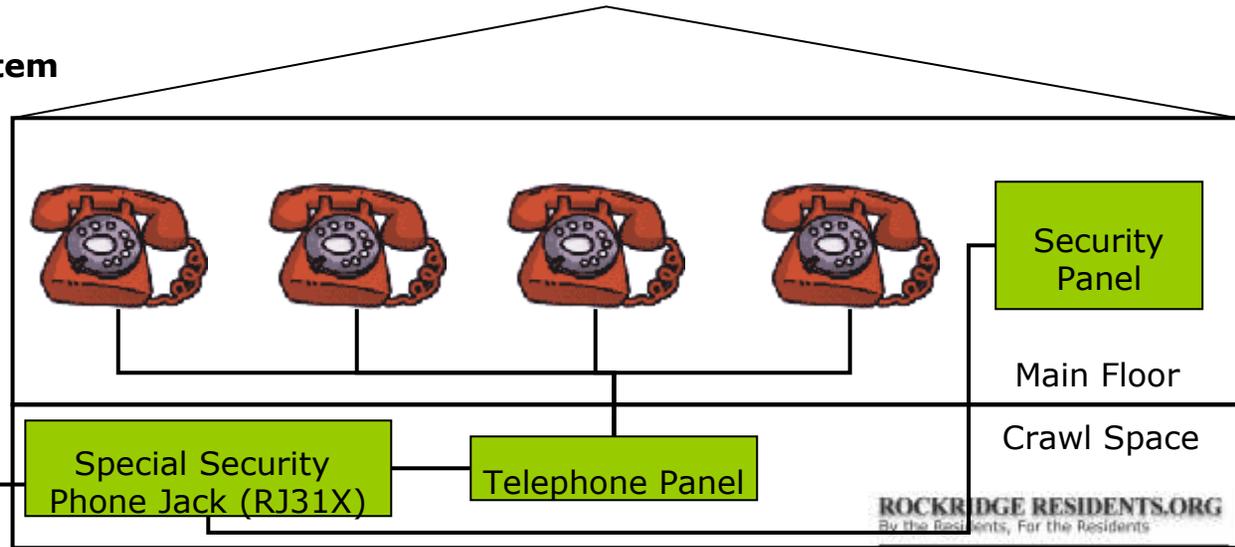
# Picture #5: Connecting to a cellphone

**No Security System**

Main Floor

Telephone Panel

Crawl Space
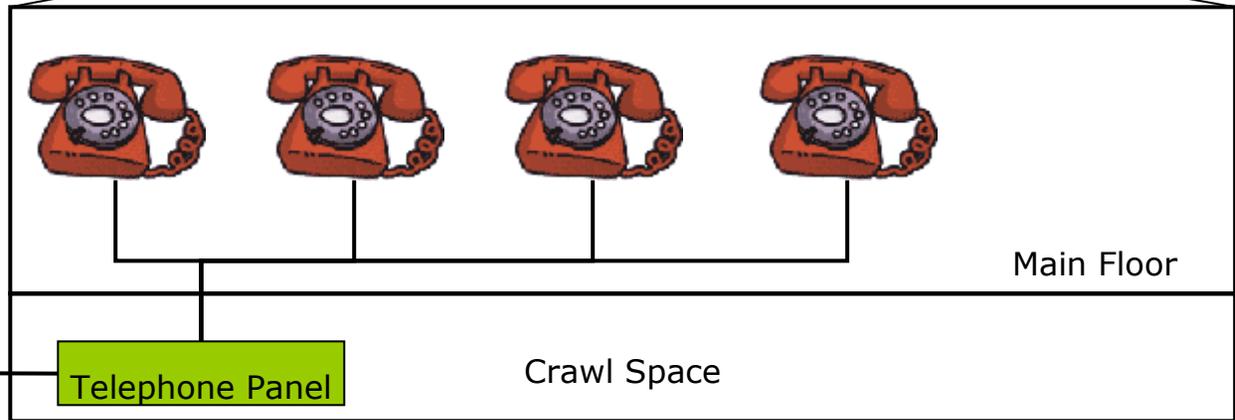
**With a cell-phone connection, the security System can dial at will. might be signal issues with our plaster/lathe ceilings.**

Security Panel

Cell-phone modem

Telephone Panel
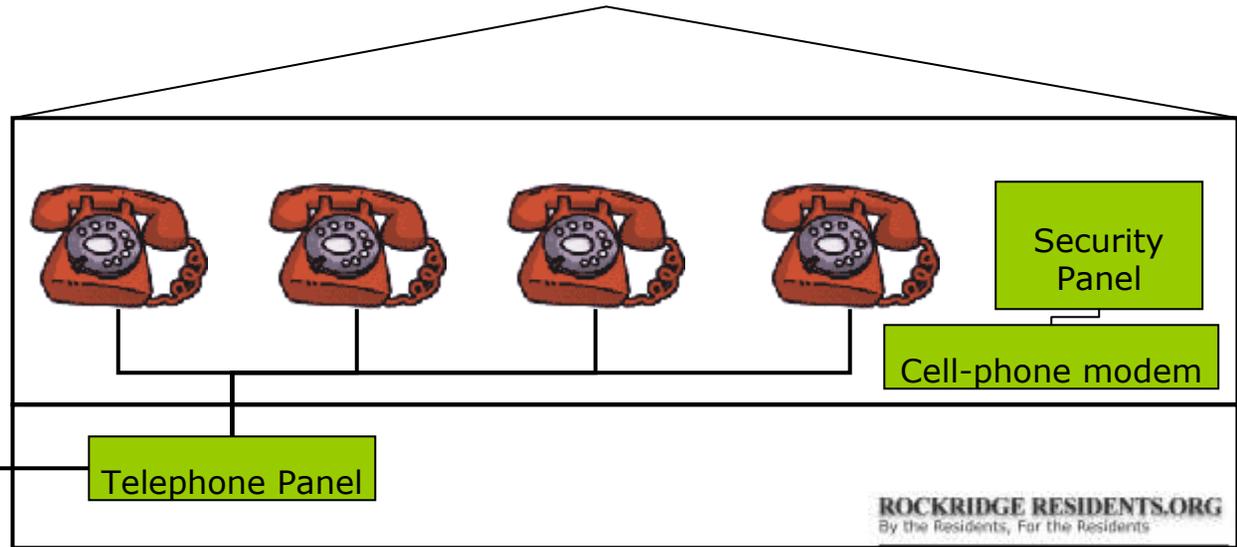
# Picture #6: "End of Line" Resistors

- ☐ An "end of line" resistor is a tiny electric component that alarm panel manufacturers have created to monitor the health of a wire.  It can help your alarm panel tell if the line has been cut or damaged
  - ■ They are designed to be put at the sensor side of your circuit. Make sure to ask your installer to <u>not</u> put the resistors inside your security panel (common practice among low-end installers) as it defeats the whole point of using them.

- ☐ Technical details:
  - ■ It's a tiny electrical component that alters the signal from the alarm panel slightly. The panel expects it, and if anything happens to that signal the alarm panel will go into an alert state.
- ☐ What could this protect against?
  - ■ A thief climbing into your attic and cutting or clipping the motion sensor wires, hence rendering the sensor useless
  - ■ You or a contractor could accidentally cut the wire when doing any house repair.

(Insert picture here)

# Picture #7: Putting it all together

**I won't show every single connection required as it's not relevant to the point of this session. But, you'll need to know those if you move forward with DIY**

Wireless Door/window Sensor

**Connect Wired Sensors**

**Connect Phone Line**

**RS232/Serial port for PC or Ethernet adapter (for PDA control)**

ELK-M1

Signal wires for Wired Door/window/Motion/etc Sensors

**Power for Wired Sensors**

Connect devices (keypads, wireless receiver, additional input cards, etc)

Wired Motion Sensor (requires power & signal)

Wired smoke or Heat detector (requires power & signal)

Keypad

Wireless Receiver
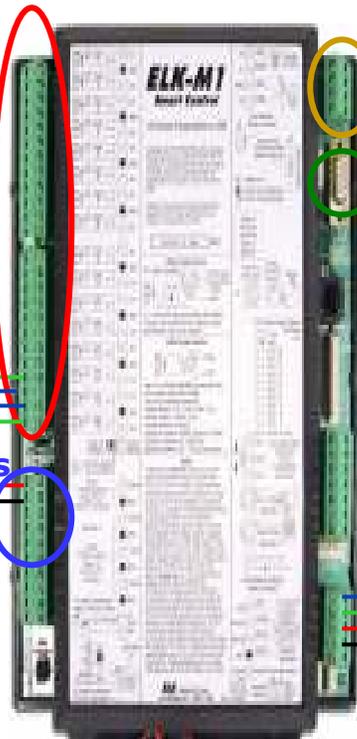
# What are some installation options?

There are other choices, but here's some common ones. 95% of the population should pick one of the first two options. #2 is a *very* compelling option, and what I'd recommend to most folks

| # | Summary | Description | Pros | Cons |
|---|---------|-------------|------|------|
| 1 | Fully Professional Install of a "closed" system (ie, ADT) | An installer takes care of everything. | 1. Easy<br>2. Fast | 1. Expensive (some upfront cost, per sensor cost, $30-$50/month monitoring)<br>2. Long Term Contract required<br>3. No or expensive PC/cellphone monitoring & control capability<br>4. Unlikely to have home automation capabilities |
| 2 | Pro Installs & tests a "DIY-Friendly" system, you can extend it or switch monitoring companies later | An installer does all the hard work (ie, mount panel, run wires, mount sensors), tests it, & gives you the programming codes so you can easily extend yourself later (or he can extend) | 1. Easy<br>2. Fast<br>3. Cell phone or PDA control<br>4. Can easily switch monitoring companies<br>5. Allows for future home automation | 1. Based on the type of contract you sign, it may be expensive to switch. |

If you are handy, you **might** be able to DIY:

| # | Summary | Description | Pros | Cons |
|---|---------|-------------|------|------|
| 3 | Pro Designs it and runs wiring, you configure panel & setup monitoring | Someone guides you on what sensors to put where, runs the wiring, does the physical install, and you configure it | 1. Semi-cheap<br>2. NextAlarm.com contract is $12/month<br>3. Leverage Expertise | 1. Requires some level of skill. Not huge, certainly doable if you put your mind to it, but like any computer program it takes a few hours to figure |

# How much to do it?

- **My personal opinion is that you shouldn't bother with the $99 front door/backdoor/2 motion-sensor packages that the big boys (ADT/Brinks/etc) offer. It's only the "Illusion of security."**
  - It offers no real protection at night if you're home, as motion sensors aren't active in that mode, and the odds of a thief using the front door or back door are absolutely nil.
  - Recommendation: Get at least your most common windows sensor'ed, and at least 4 motion sensors.
- **There's many variables in estimating the cost, but here's some basic options:**

| Option | Cost SWAG | Comments |
|---|---|---|
| 1 (Pro Install, "Chain" company like ADT/Brinks) | $99 and up for upfront costs, plus monthly contract | Monthly contracts could be expensive and multi-year, and in the long run will definitely be more expensive. But, it's better than nothing! |
| 2 (Full Pro install of an Elk) | Variable based on size of install & difficulty of house | Definitely the recommended approach. Someone else does all the hard work, but you're not locked in to a given company for life. |
| 3 (Pro Design & Install, Self-configure, self-setup of monitoring) | $100-$500 for basic consult, plus labor for wiring costs, plus parts, but you get $12/month monitoring | Won't really save you huge amounts of money, but you will get the satisfaction of understanding how to do this so you can easily extend later and/or switch companies. |

# How much would parts cost ?

☐ These options all use a high-end DIY-friendly security panel so you can extend yourself later. There are cheaper options, but I don't know anything about them.

| # | Title | Cost SWAG | Parts List (price if bought online on 6/22) | Comments |
|---|-------|-----------|---------------------------------------------|----------|
| A | "Illusion of Security" - 4 wired sensors, the $99 special | $430ish | $340 - Elk EZ8 with KP2 keypad<br>$35 – 2 Wired Motion Sensors<br>$5 – 2 Wired Door Sensors | This is a low-value option as per the prior "Illusion of Security" point. |
| B | "Illusion of Security" – 4 wireless sensors | $590ish | $340 – Elk EZ8 with KP2 keypad<br>$170 – 2 Wireless motion sensors<br>$80 – 2 Wireless Door/Window sensors | Same as above but wireless |
| C | "Minimum recommended" 10 sensors, 2 doors and 4 motion wired, 6 wireless windows, external light/sound) | $665-$950 | $340-$625 – Either Elk EZ8 or M1G<br>$80 – 4 Wired Motion Sensors<br>$5 – 2 Wired Door/Window Sensors<br>$240 – 6 Wireless Door/Window Sensors<br>$85 – External Siren & Strobe Light | ☐ Either the EZ8 entry level Elk or the top-of-the-line M1G panel that can do much more than just security,<br>☐ Decent # of sensors.<br>☐ Assumes wireless window sensors for ease of installation<br>☐ External siren & Strobe light for deterrent |
| D | "Almost complete, Redundant coverage, cell phone accessible" | $1690 - $1975 | $340-$625 – Either Elk EZ8 or M1G<br>$160 – 8 Wired Motion Sensors<br>$5 – 2 Wired Door/Window Sensors<br>$600 – 15 Wireless Door/Window Sensors<br>$135 – 3 Glass break sensors<br>$85 – External Siren & Strobe Light<br>$365 – network interface & cell phone program | ☐ If you order all this at once, I'm **sure** you'll get a price break, but I can't even guess about that.<br>☐ I didn't call this "complete coverage" as there could *always* be more stuff. But it's pretty close. |

# Examples of Where to Buy

Contact Info is listed here to make life easier on you, but you need to do your own homework to make sure you like these people. I have personal dealings with the online vendors in #3 and was happy, but you need to form your own opinion.

- ☐ Option #1: ADT/Bay Alarm/etc.
  - ■ www.google.com ☺

- ☐ Option #2: Pro-install of a DIY-friendly system
  - ■ Install:
    - ☐ Ideal Protection Services
      - ▪ Mario Velasco, (925) 757-9192, Mario.IPS@sbcglobal.net
    - ☐ Any security installer *might* be willing to do this, it's worth asking

- ☐ Option #3: Pro-design, pro-wiring, you configure
  - ■ Design: Deco Group Partners
    - ☐ Nathan Gregory, Castro Valley, 510-744-1532, ngregory@deco-group-partners.com
  - ■ Wiring: Your favorite electrician
  - ■ Monitoring: NextAlarm.com
  - ■ Parts:
    - ☐ Storefront
      - ▪ Lasher's Electronics, 1734 University, (510) 843-5915, info@allashers.com
      - ▪ HomeTech Solutions, Cupertino, (408) 257-4406, www.hometech.com
    - ☐ Online
      - ▪ AutomatedOutlet.com
        - ▪ Brandon Stapp, Brandon@automatedoutlet.com, (214) 245-4594
      - ▪ Tech-Home.com
        - ▪ Brian Dye, Brian@tech-home.com, 417-368-0995

# Other options

- Bob Lasher of Al Asher's electronics on University Ave sells these security-only panels. I know nothing about these, but if you want to know, he'll be happy to help. (all prices are parts only, he knows of installers for them)
  - Entry-level hardwired system - $200
    - DSC Classic
      - Control panel, keypad, 3 door switches, motion detector, siren ($250 if you want a wireless receiver to add wireless sensors later)
  - Entry-level wireless system - $425
    - Visonic Powermax
      - Keypad, wireless receiver, siren, keychain keyfob, 2 door/window contacts, 1 motion detector
  - Full-featured Wired system - $695
    - DSC Classic
      - Same as #1, but with 14 wired sensors, 2 high-end motion detectors, 4 pet-friendly motion detectors, all wire

# Appendix A

## Things to remember

# Top 10 security things to remember

1. **Always ask for the installer codes for your panel so you're not locked in to any given monitoring company**
2. **If the old owners of your house had a security system, you \*may\* be able to re-use the sensors or wiring.**
3. **Secure your external phone lines**
   - Don't put in a fancy security system, but leave your phone wires open  so anyone can cut them. Encase them in tubing. You can also put in a cell phone monitored system, but that costs more.
4. **If time permits, always put in a wired sensor over a wireless.**
   - Wires will always work. Wired sensors don't need to have batteries replaced, and new wireless technologies won't interfere with it.  The odds of you cutting a wire in the future are slim, unless you like to mess around \*inside\* your walls
5. **Put in a wireless sensor instead of no sensors.**
6. **Put enough sensors in so you stop the thieves as soon as possible.**
   - Don't get an "entry level" package unless you can't afford anything else – 2 door sensors and 2 motion sensors aren't enough to cover a 1600+sqft house.
7. **Use redundant sensors in case the thieves know how to bypass one of them.**
   - Use Glass break sensors to detect windows breaking, Door & Window sensors for the perimeter, and motion sensors for the inside.
8. **Ask the installer to make sure he puts the "end-of-line" resistor at the end of the line at the sensor.**
   - They protect against sensor wire tampering, but if they're inside the panel they do no good.
9. **Put an external siren & strobe as a clear deterrent**
10. **Get a "duress" code programmed into your system, to warn police in case of home invasion**

# Top 10 other things to remember

1. Put motion-sensor lighting on all 4 outside walls of your house so that thieves can't hide in the dark for a long time while messing with doors/windows
2. Cut back the shrubbery, plants, or trees near your house, esp near windows so thieves don't have somewhere to hide while they look for sensors.
3. Get a "duress" code programmed into your system, to warn police in case of home invasion
4. Consider putting in a camera system to record suspicious behavior or thieves in case something does happen
5. Do fire drills, especially if you choose to put fire/smoke sensors on the Elk. It's a very different sound, you want everyone to know what it sounds like.

# Appendix B

What can an Elk do that other
systems cannot do?

# List of Elk capabilities

- Easy to add more sensors yourself later
- Unique devices (ie, magnetic door locks, water sensors, etc)
- Keychain FOBs to arm/disarm/lighting from your car (if desired)
- Use telephone to control
- Home Automation
  - Lighting
  - HVAC
  - Irrigation
  - PC Integration

# ElkRM (PDA) Screenshots

☐ I use another package, but ElkRM is the easiest one to use with the Elk

# Appendix C

Screenshots of the ElkRP
(Remote Programming)
Configuration Software

# ElkRP - Users

Easily add multiple users, including a "duress/holdup" user

# ElkRP – Add Sensors

Add Sensors (Zones)

# ElkRP - Keypads

Add multiple keypads

# ElkRP - Monitoring

Enter the telephone # and account # the Elk should use when reporting
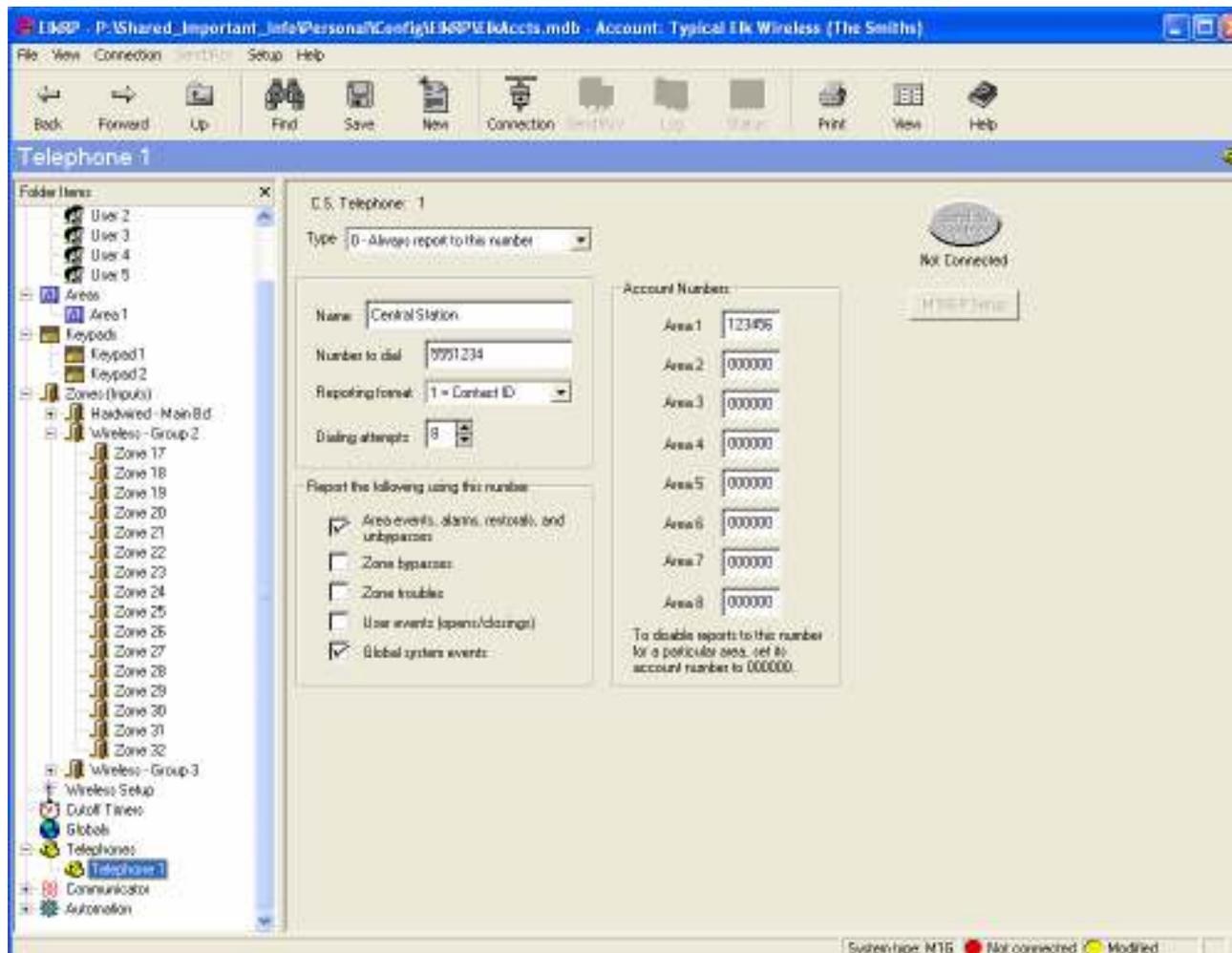
# ElkRP - Monitoring

Configure the system to only report those conditions to the monitoring station that you want them to be aware of