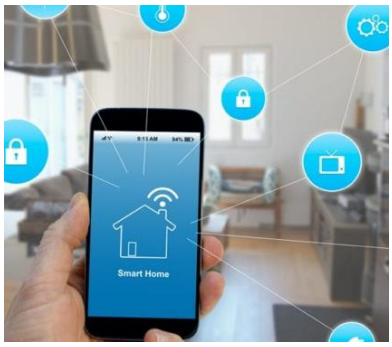
Smart Devices & Services for Independent Living



Seniors Independent Living Collaborative

Smart Self Reliance Collaborative

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Smart Self Reliance

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Smart
Self Reliance

Contents

Introduction 1

Smart Devices & Services: Defined 1

Required Hardware & Software 2

Costs & Financial Assistance 4

Benefits of Smart Devices & Services 9

Improved Personal Health 9

Reduced Hazards & Threats 10

Enhanced Control of Home Systems 12

Improved Care Team & Social Connections 14

Increased Housing Affordability 16

Accessibility Support 19

Command Device Accessibility 19

iOS Accessibility Features 19

Android Accessibility Features 25

Assistive Technology Software & Hardware 28

Assistive Technology Services 38

Smart Device Selection & Installation 40

Smart Device Selection 40

Smart Device Installation 41

Sponsors & Authors 42

Appendix 43

Appendix A: Primary Internet Service Providers in Illinois 43

Appendix B: Popular Smart Devices, Features & Pricing 46

Appendix C: Frequently Asked Questions 53

Appendix D: Glossary of Terms 56

Appendix E: Additional Resources 61

Introduction

> *"…The right technology can make the world bend a little bit toward the user rather than just bending the user toward a normative world."*
>
> *"Adaptive technology…is not about helping, but about shifting both the body and the world into closer harmony."*
>
> - Sara Hendren
> Author, What Can a Body Do: How We Meet the Built World

Today, the Internet and information and communication technologies enable all of us to create a workable home environment and to live with greater independence. The integration of these technologies into devices that enable our remote control of lighting, heating, and cooling systems and other electronic equipment is known as smart home automation. This Guide introduces the independent living benefits of smart home automation and the smart devices and services that can enhance your safety, security, comfort and connection to family, friends, and communities. The Guide also describes how to select a smart device to meet your needs and provides additional guidance on installation and enrollment in related utility smart pricing services.

Smart Devices & Services: Defined

Smart devices utilize the Internet and wireless communication technology to remotely control and automate the operation of a home's electronic and electro-mechanical equipment and systems from practically any location through use of a mobile device or voice-activated digital assistant. This includes the control and automation of heating, ventilation, and air-conditioning systems and the operation of lighting, windows, doors, shades, appliances, security and entertainment systems and much more. The pairing of these smart devices with available adaptive/assistive technologies ensures that a wide range of people with disabilities can take advantage of the independent living benefits they provide.

Smart services are those utilizing the same Internet and wireless communication technology to deliver a host of consumer services quickly, efficiently, and often at less expense. Examples of smart services include the various voice-activated digital assistance services, online grocery and consumer product shopping services, and cost-saving utility programs and services now offered by Illinois' largest utilities. The smart digital assistant and shopping services are discussed in the context of their companion devices described below. The smart cost-saving utility programs and services are described in a standalone sub-section below given the significant contribution they make to increasing housing affordability.

Required Hardware & Software

Smart devices operate in response to digital signals they receive from a user sent through a command device over an Internet or a wireless Bluetooth connection. The key hardware and software components that make this possible include Internet service, a modem, a wireless router, a command device and a wireless Bluetooth connection. Each of these components and their interactions are briefly described below.

Internet Service
Internet service gives you access to email, news, online shopping, music, tv shows and movies and much more and allows you to set up a wireless home network to support the operation of your smartphones, computers and the smart devices described in this Guide.

You purchase service through an Internet Service Provider (ISP). Most telephone or cable television companies now serve as ISPs in addition to independent providers such as Xfinity, Earthlink, ViaSat, Atlantic and many others. There are 4 different types of internet connection that can be established. These are Dial-up, DSL, Cable, and 3-, 4- and 5G connections.

- Dial-up connects to the Internet through a telephone line and is slower than the other connections described below but, in some areas, may be the only option available.

- Digital Subscriber Line (DSL) also connects to the Internet through a telephone line but allows data to move at higher speeds than dial-up access. As a result, DSL is known as a broadband Internet connection providing the bandwidth necessary to accommodate the large data streams required to watch television and movies, to play games and to rapidly browse the Internet.

- Cable connects to the Internet through your television cable and, like DSL, is a broadband connection.

- 3G, 4G and 5G are wireless broadband Internet connections typically used for smartphones, but they can also be used to establish a home Internet connection.

The type of Internet connections offered will vary by provider and each will offer alternative data service speeds with different price points. The faster the internet connection, the more you will pay per month. Once the Internet plan is purchased over the phone or on the Internet, the company will send out a technician to set up your service and may include the installation of a modem and other equipment necessary to establish your Internet connection.

***Important Note**: Consumers should be aware that a less costly Internet plan will provide slower speed that may impede the set-up and operation of a smart device so it is recommended that the minimum required operating speed be confirmed before a device is purchased. On the other end of the speed spectrum, consumers should be aware that many smart devices will not work on ultra-high speed 5G broadband

Internet service. Confirming the maximum operating speed of service is also advisable before purchase.

Internet Accessibility Discounts – Some ISPs provide discounted service to low-income households. Presently, one such program is AT&T's Internet Access Program that offers wireline Internet service to households that participate in the Supplemental Nutrition Assistance Program (SNAP) for as little as $10/month. The program also provides free installation and in-home Wi-Fi with no annual contract or deposit. To learn more, visit: https://www.att.com/internet/access/

Additional low-cost plans under $50/month can be found on the Whistleout website at: https://www.whistleout.com/Internet/Guides/cheap-internet-plans

Modem

This device transmits digital information from your computer and other connected smart devices to the Internet Service Provider (ISP) and then to other locations and users connected to the Internet. Although your ISP will offer to rent you a modem, you may purchase one from a store and set it up yourself. Depending on the selected ISP, the modem is plugged into your telephone jack or cable connection and then into your laptop or desktop computer where on-screen instructions are provided to set it up. Once installed, the wireless router can be plugged into the modem to broadcast the Internet signal throughout the home. Some modems will have a built-in router so you may not need to rent or buy a separate device.

Wireless Router

A wireless router is a device that broadcasts an Internet signal from a modem across a large area, creating what is known as a "Wireless Home Network" or "Wi-Fi network". A Wireless Fidelity (Wi-Fi) network connects devices located within the same network to each other through a wireless radio frequency and to the Internet through a modem. To set-up the wireless router a user plugs it into a computer and through a web-browser follows the on-screen instructions. During this process, the user will give the router a unique name or "Wireless SSID" and a password that will be used later to connect each smart device in your Wi-Fi network. Once the set-up is complete, the user disconnects the computer and the Wi-Fi is ready for use.

For larger home spaces, users may want to consider a range extender device or a mesh Wi-Fi or Whole Home Wi-Fi system. This system has a base or main router that connects to the modem and additional satellite modules that are placed throughout the home. This system eliminates dead spots where the Internet is not available. These systems consistently provide a steady, strong Internet signal inside your home, no matter your location.

Important Note: Many smart devices only operate on a 2.4 GHz Wi-Fi router. Therefore, make sure that any upgrade to a 5G Wi-Fi router, includes the option to accommodate devices operating at a 2.4 GHz bandwidth, as well.

Command Device

A command device can be a smartphone, tablet, laptop/desktop computer or voice-activated personal assistant with an established connection to the home's local Wi-Fi network. When a smart device is purchased, the user will use the command device to go online to the purchased device's website, download its application and follow the on-screen instructions to link the two devices. This will entail registering the purchased device with the home's local Wi-Fi network by entering its name and password. The user is then able to control the purchased device through the shared Wi-Fi connection. While most smart devices operate through a Wi-Fi network connection, some operate through a wireless Bluetooth connection.

Bluetooth Connection

Bluetooth is a wireless technology standard that allows connected mobile devices to exchange data over short distances up to 30 feet. A Bluetooth connected device does not use the Internet to facilitate these exchanges but instead uses radio waves to pair the command device with the connected mobile or smart device.

Costs & Financial Assistance

Smart devices range in cost from as little as $8 for a lightbulb or an outlet to $500 dollars for an advanced security or leak detection system. For those requiring the use of adaptive/assistive technology to operate their command devices, there will be an additional cost ranging from as little as $16 for a touch switch to $16,000 for an advanced eye gaze system. Appendix B provides a list of some of the more popular smart devices currently on the market along with a description of their features and prices. Smart services associated with some devices (such as a grocery shopping) will also carry a service fee and/or require a monthly subscription. However, many services made possible by smart technologies *save* rather than *cost* users money, such as the cost-saving utility smart pricing programs described in this guide. In addition, many of the functions that smart devices and services provide reduce the need for and costs associated with personal assistants that would otherwise be necessary.

Financial resources are available for the purchase of smart devices when they are part of home modifications enabling people with disabilities to live more independently. These include automated climate controls, accessible computer equipment, remote controlled lighting and door openers, software tools, wearable medical alert devices and remote monitoring and security systems. Financial resources include grants, loans, charitable services, and Medicare, Medicaid, VA, HUD and Department of Agriculture loan and grant programs. A brief description of each follows.

Home Improvement Grants – These are typically one-time grants made by independent foundations, corporate giving programs, nonprofit charitable organizations, and municipal entities through a variety of community service initiatives. Advocacy programs and Centers for Independent Living can provide guidance on how to go about researching available home improvement grant opportunities for people with disabilities in Illinois. Grants do not need to be repaid.

Low-Interest Loans – Some Illinois municipalities and governmental entities operate low-interest loan programs for home modifications or guarantee loans to encourage banks to be less restrictive in their lending requirements to accommodate accessibility renovations. Readers are encouraged to check with their community service departments to inquire about existing programs in their area.

Financial Loans – The Illinois Assistive Technology Program (IATP) operates an equipment loan program known as "ATLOAN$" that enable qualifying residents to finance the purchase of assistive technology devices costing between $1,000 and $30,000.

Charitable Services – Several Illinois organizations have begun to pilot test technical assistance programs designed to assist persons with disabilities acquire and install smart home automation devices to support independent living. One corporate example is Ameren Illinois' Accessibility Pilot Project that provides smart device installation assistance to persons with disabilities that increase independence and energy efficiency while decreasing monthly utility bills.

A similar nonprofit initiative is being piloted by the Smart Self Reliance Initiative with support from the Illinois Science and Energy Innovation Foundation, the Christopher and Dana Reeve Foundation and Google. This initiative is known as the Student Mentors Assistance Project (SMAP) which employs trained high school seniors to assist persons with disabilities with smart device installation and enrollment in smart utility pricing programs. To learn more about the Ameren Illinois pilot project please follow this link to their video overview: https://vimeo.com/389561909/74bd67f867//

To learn more about the SMAP, please visit https://smartselfreliance.org/installation/

Medicare – While the original Medicare program does not pay for home modifications that would include smart devices, it may pay for home modifications that include assistive technology devices if they are required for medical purposes and prescribed by a doctor. Also, Medicare Part B will pay for the cost of an occupational therapist to evaluate a home to determine what modifications might be required.

Medicare Advantage Plans – While Medicare is less likely to be the source of financial assistance, the privately sold Medicare Advantage or "Medicare Part C" plans offer supplemental benefits that do cover home modifications that could include smart assistive technology devices for recipients with demonstrated medical need. According to one source, benefits under these plans are likely to be expanded in the next year to include non-medical benefits for chronically ill persons (source: payingforseniorcare.com).

Illinois Home and Community Based Services (HCBS) Waiver Programs – The Illinois Division of Developmental Disability (DD), Illinois Division of Rehabilitation Services (DRS) and Illinois Department on Aging (IDoA) operate statewide Home and Community Based Services (HCBS) waiver programs that may enable users to purchase some of the devices described in this guide. An individual may only be enrolled in and receive services through one HCBS waiver program at a time. Prior to making a referral for services, it is important to choose the most appropriate program based upon your individual situation.

The Illinois Department of Human Services' Division of Developmental Disabilities administers three HCBS waiver programs. They include the Children and Young Adults with Developmental Disabilities - Support Waiver, the Children and Young Adults with Developmental Disabilities - Residential Waiver, and the Adults with Developmental Disabilities Waiver. The HCBS programs offer approved participants with intellectual and developmental disabilities (I/DD), as part of an array of services to support independence, reimbursement for the cost of adaptive equipment. The reimbursement may also cover the cost of training and Assistive Technology service assistance.

Adaptive equipment is specified in a participant's Person Centered Plan and is defined as "(a) devices, controls, or appliances that enable participants to increase their ability to perform activities of daily living; (b) devices, controls or appliances that enable participants to perceive, control, access or communicate within the environment in which they live; and (c) such other durable equipment not available under the State Plan that is necessary to address participant functional limitations." Assistive Technology (AT) service is defined as a service that "…assists a participant in the selection, acquisition, or use of an assistive technology device." Services may include:

- A functional evaluation of the participant and an AT needs assessment conducted in the home,
- Assistance in purchasing and leasing AT devices,
- Customization of the AT devices for use,
- Coordination of AT device use with other therapies described in the Person Centered Plan,
- Participant and care provider training in device operation and maintenance.

To apply for a Developmental Disability Waiver, individuals with I/DD must meet with an Independent Service Coordination Agency to determine eligibility for services.

- Consult the DHS Office locator to find the agency near you, https://www.dhs.state.il.us/page.aspx?module=12

- For additional information contact: 1-888-337-5267 or 1-866-376-8446 (TTY)

The Illinois Division of Rehabilitation Services (DRS) - Home Services Program (HSP) operates 3 Home and Community Based Services (HCBS) Waiver Programs: Persons with Disabilities, Persons with Brain Injury and Persons with HIV or AIDS.

HSP offers approved individuals an array of devices or equipment purchased, repaired or rented to promote independence, prevent an increase in care, reduce or eliminate another service or ensure the individuals' health and safety in the home. Prior to being considered for adaptive equipment, assistive technology, or home modification, an individual must first qualify for and receive other services through HSP.

Adaptive Equipment and/or Assistive Technology Services may include:

- A functional evaluation of the participant and an AT needs assessment conducted in the home,
- Assistance in purchasing and leasing AT devices,
- Customization of the AT devices for use,
- Coordination of AT device use with other therapies described in the approved waiver plan

To apply for HSP services, prospective recipients must contact:

- The Home Services Program, or submit a referral for HSP services on the HSP website at: www.dhs.state.il.us.
- To contact the Division of Rehabilitation Services Home Services Program go to the DHS Office Locator at: https://www.dhs.state.il.us/page.aspx?module=12
- Or phone 1-877-761-9780 or 1-866-264-2149 (TTY)

Illinois Department on Aging (IDoA) – The IDoA HCBS waiver program is known as the Community Care Program (CCP). Among other services, the program provides waivers to eligible seniors for automated medication dispensing (AMD) and emergency home response service (EHRS) devices. AMD devices emit auditory, visual or voice reminders to take medications and provide tracking and caregiver notification of missed doses. The device is supported through a telephone line or wireless/cellular connection. The EHRS device is a wearable two-way voice communication unit such as a pendant or wristband and a base unit that enables the user to access a 24-hour support center that can dispatch emergency responders when needed. Eligibility requirements for these services include age – 60 years old or older; U.S. citizenship; Illinois residency; non-exempt assets of under $17,500 and a determination of need assessment.

To learn more, visit the CCP website at:

- https://www2.illinois.gov/aging/programs/ccp/Pages/default.aspx
- Or, contact the Illinois Department on Aging Senior Helpline at 800-252-8966

Veterans Programs – The Veterans Administration operates multiple grant programs (SAH, SHA and HISA Grants) to provide veterans financial assistance in making home modifications and particularly modifications that accommodate a disability whether connected to their military service or not. Veteran pensions can also be a source of financial assistance for these modifications through a one-time bonus mechanism for unreimbursed medical expenses. The nonprofit veteran advocacy organization known as “Rebuilding Together” also offers financial assistance for home modifications through its “Heroes at Home Program” that may be a valuable financial resource to consider for veterans with disabilities.

HUD & Department of Agriculture Programs – Both the US Departments of Housing and Urban Development (HUD) and Agriculture (DOA), and their state counterparts, operate what are known as nursing home diversion initiatives that provide loan assistance for home modifications to increase the independence of persons aging in place. HUD’s initiative is the Home Improvement Loan program and the DOA’s initiative is the Rural Repair and Rehabilitation Grant program. Readers should contact their local HUD of DOA offices for more information.

Benefits of Smart Devices & Services

The use of smart devices and services provide the occupant of any home or apartment five essential independent living benefits. These include:

- Improved personal health
- Reduced hazards and threats
- Enhanced control of home systems
- Improved care team and social connections, and
- Increased housing affordability

This section describes how smart devices and services deliver each of these benefits and provides links to additional information on device models, pricing, programs, and purchase/ enrollment locations currently on the Internet.

Improved Personal Health

Living well and independently with a disability requires good personal health. When needed, emergency assistance and the support of others to assist in healthcare monitoring and intervention are essential to the well-being of some people with disabilities. Smart devices enable you to ensure this assistance through emergency alerts and health and activity monitoring.

Emergency Alert Devices

Most of these devices entail the use of wearable emergency alert transmitters embedded in watches, bracelets, necklaces and garments that enable the user to request assistance from a trusted contact or an emergency services dispatcher in the event of a fall or other life-threatening event. Some of these devices also monitor physical health attributes such as heart and respiration rates, provide medication reminders, and feature fall detection sensors and distress alerts that operate independently of the user.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/emergency-alert-devices/

Health Monitoring Devices

These devices combine health attribute monitoring and activity sensors in sophisticated tracking systems that establish the user's daily activities, routines, and sleep patterns as a baseline. Once established, the sensors and tracking software can identify and report any significant deviations from the baseline activities, routines, and patterns to family or outside care providers. These systems often utilize a combination of wearable sensors and an array of heat, sound, light, and motion

sensors mounted throughout the home where the essential activities of daily living take place, such as the kitchen, bathroom, and entryways. The systems are designed to operate independently, but most also include a voice activation feature allowing the user to call for assistance when needed. It should be noted, however, that care provider access to a user's personal health information and activities should be based on the informed consent of that user.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/health-monitoring-devices/

Reduced Hazards & Threats

Smart devices can reduce the threat of harm and property damage from falls, toxic substances, poor air quality, floods, and the presence of intruders - all of which make your home a safer place in which to live. Fortunately, there are many smart devices on the market today that can deliver this benefit. These include smart: lights and lighting controls; smoke and gas detectors; air quality sensors and purifiers; leak detectors; door locks; doorbells and monitors, and interior and exterior cameras.

Lights & Lighting Controls

Accidental falls are a leading cause of injury-related deaths among older adults in the United States. Beyond certain health conditions and medications that impair balance, the principle cause of most falls is environmental. Besides trip hazards such as loose rugs, extension cords, and slippery surfaces, the top environmental factor contributing to a fall is insufficient lighting and access to light switches. Smart lights and lighting controls can address this hazard and a variety of options are now available to control (turn on/off and dim) home lighting systems safely through voice-activated digital home assistants and through remote control devices.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/lights-and-lighting-controls/

Smoke & Gas Detectors

Smart smoke and gas detectors not only detect smoke, carbon monoxide and high temperature hazards, but they also eliminate the potential hazard of falling off a ladder as they can be controlled from a smartphone application or a voice-activated digital assistant from any safe location. Some detectors can also alert family, friends and care providers and call for local emergency services.

Important Note: Many of these devices utilize audible alarms which will not be suitable for use by individuals who are deaf or hard of hearing. However, some device manufacturers do include visual and touch prompts that alert these users to hazards, such as strobe lights and

vibration. To learn more about smoke alarms/carbon monoxide detectors for the deaf, please visit: bit.ly/2MijQFc

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/smoke-and-gas-detectors/

Air Quality Sensors & Purifiers

These provide 24/7 monitoring of the temperature, humidity and volatile organic chemicals (VOCs), other toxins and dust in the home and alerts the occupant when air quality indicators reach harmful levels. Some of these devices also respond to undesirable air quality by triggering the operation of heaters, fans, humidifiers, and air purifiers and shut them down when acceptable air quality standards are reached. Most of these devices come with their own applications that allow users to see real-time air quality levels displayed numerically and graphically over time and to control the manual operation of connected devices.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/air-quality-sensors-and-purifiers/

Leak Detectors

These smart devices can detect even the smallest of leaks from pipes in the kitchen, bath, or laundry areas or from refrigerators and dishwashers. Once detected, they alert the homeowner by smart phone or digital assistant to their presence before too much damage occurs. Some of these devices are even equipped with automatic shut-off valves that stop a leak immediately upon detection.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/leak-detectors/

Door Locks

Smart, programmable door lock devices enable you to manually or automatically lock and unlock doors remotely though a smartphone application and enable you to share virtual keys with family, friends and care providers on a permanent basis or for a scheduled period of time. They also provide security alerts and notifications through the application and some are wired to security services to respond to forced entry.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/door-locks/

Doorbells & Monitors

Smart doorbell and entrance monitoring systems allow you, family members, or care providers to monitor and record visitors from any location. Most feature wireless, high definition cameras with 2-way audio and some have night vision lenses. On-board motion detectors can send notifications to users that someone is near the door and activate both the camera and audio channel on the user's smartphone. In addition to smart phone control, some systems are equipped to operate through digital assistants, as well.

Important Note: Many of these devices utilize audible alarms which will not be suitable for use by individuals with hearing loss. However, some device manufacturers include visual and touch prompts that send alerts to users, such as strobe lights and vibration. To learn more about doorbells and monitors for the deaf, and hard of hearing, please visit: https://dailyhomesafety.com/best-doorbells-for-the-hearing-impaired/

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/doorbells-and-monitors/

Interior & Exterior Cameras

Smart, wireless security cameras allow you to monitor interior or exterior space remotely through a smartphone or tablet. Most feature waterproof cases housing high resolution lenses with exceptional picture quality, 2-way audio, motion detectors, very loud sirens, and video recording capabilities. Some also feature built-in floodlights that automatically trigger when they detect motion from a person, car, or animal. In addition to smartphone control, several of these devices can also be operated through voice-command with digital assistants.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/interior-and-exterior-cameras/

Enhanced Control of Home Systems

Our independence is related to the degree to which we can perform the activities of daily living. Smart control devices can enhance your ability to perform these activities while increasing your comfort effectively and conveniently. These devices include smart thermostats, appliances, electrical outlets, controllers/ hubs, and digital assistants.

Thermostats

Programmable and Wi-Fi-enabled smart thermostats allow you to monitor and control heating, ventilation, and air-conditioning levels from any location using a smartphone or voice-activated digital assistant. Most of these devices are also capable of learning your space-conditioning preferences at different times of the day and adjusting the system to meet them automatically. Most come with large, clear displays, additional room sensors that detect and trigger a response to hot or cold spots and some come with wall-mounted and stand-alone touch screen controllers.

Browse Popular Devices:
https://smartselfreliance.org/smart-devices/thermostats/

Smart Appliances

In addition to allowing you to schedule and operate them from any location using a smartphone, tablet or your computer, smart appliances can also send alerts of equipment malfunctions and most have automatic shut-off features as well. Popular appliances include refrigerators, coffee makers, washers and dryers, and ovens. In the case of smart refrigerators, many have interior cameras that allow you to view what you do and don't have when you are grocery shopping. Some even allow users to make grocery lists by voice command through a digital assistant and send it to a subscriber's grocery shopping and delivery service.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/appliances/

Electrical Outlets

Smart electrical outlets allow you to control any other devices plugged into them through a smartphone, tablet or computer, or by voice-command using a digital assistant. These inexpensive devices are frequently used to control non-smart devices such as lamps, radios, fans, humidifiers, air purifiers, coffee makers, and other common kitchen appliances.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/electrical-outlets/

Device Controllers / Hubs

A smart device controller, also known as a hub, is a central control unit that connects multiple smart devices in the home and allows communication among them. These units monitor the status of connected devices, can learn preferred settings according to the time of the day or day of the week and can trigger their operation accordingly. They can also be controlled through an application on a smartphone, tablet or computer or by voice command using a digital assistant.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/device-controllers-and-hubs/

Digital Assistants

Arguably the single most useful device to extend one's independence, a digital assistant can control almost every other smart device in the home and can provide hands-free access to anything that can be found on the Internet. Most also allow users to place phone calls and function as decent speakers for music, audio books, radio, and television broadcasts, and practically any other audio subscription service available.

Browse Popular Devices:
https://smartselfreliance.org/smart-devices/home-assistants/

Improved Care Team & Social Connections

Smart devices can also improve the efficiency and effectiveness of an individual's healthcare by enabling care providers to access information about their needs and status from any location. As mentioned under the "Improved Personal Health" benefit above, care providers can receive information from emergency alert and health monitoring devices which will enable them to respond more rapidly to an individual's physical needs and especially in an emergency situation where one may otherwise be unable to communicate the need for assistance. The use of occupancy sensors and telehealth services can also improve the ability of care providers to perform their services as described below. With regard to improved social connections, smart devices that enable users to regularly interact with family members, friends and care providers by videoconference have proven to be extremely valuable and particularly during long periods of time where social distancing is necessary to maintain everyone's health (e.g., our recent experience with the Coronavirus pandemic). Tablet PC devices serve this function and provide other valuable functions, as well.

Occupancy Sensors

An occupancy sensor is an indoor motion detecting device used to detect the presence of a person or the movement of a door or window, and to automatically trigger the energy-efficient operation of other devices such as lighting controls or heating, ventilation and air-conditioning systems. While these are all useful functions, occupancy sensors can also be used to enhance the ability of a care provider or team of providers to monitor movements of a care recipient in relation to established and healthy patterns of movement in the home. Changes from expected patterns of movement indicating routine use of the kitchen, bathrooms, and other spaces may be indications that a wellness visit is necessary. These devices are typically operated and controlled through applications on a smartphone, tablet or computer.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/occupancy-sensors/

Telehealth Devices

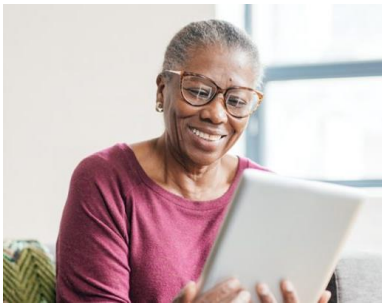
Telemedicine is the application of telecommunication technology that enables one to receive clinical healthcare services from a distance. Telehealth often includes clinical healthcare services but also refers to the use of the same technology to deliver non-clinical services that attend to overall health, nutrition, and well-being.

The technologies used to deliver both telemedicine and telehealth include smartphones, the Internet, computers, tablets, wearable and mobile medical devices (e.g., vital sign and heart monitors), video cameras and a variety of software applications that facilitate the delivery of clinical and non-clinical services. Many clinical and non-clinical service providers now offer telehealth options that can significantly improve access to immediate care when it's needed. The healthcare monitoring, occupancy sensor and camera devices described earlier in this Guide can all be enlisted to facilitate the delivery of telehealth services along with several custom-made devices found through the link below.

Browse Popular Devices:

https://smartselfreliance.org/smart-devices/telehealth-devices/

Tablet PCs & Social Media Apps



Everyone benefits from access to and interaction with family members, friends and the communities of which we are a part. Computer tablets have proven to be the go-to smart devices that enable all of us to remain connected to one another. Essentially portable personal computers, these devices provide access to the Internet anywhere within reach of a Wi-Fi connection or when beyond reach, by connecting the device to a smartphone and your mobile data stream.

All tablets feature touch screens and on-screen keyboards and microphones that enable you to browse the Internet by typing or speaking your search question. Most also have long battery life (10+ hours) and many handy applications (apps) typically found on laptop or desktop computers. These apps include FaceTime, Zoom and the other popular video calling and conferencing applications that enable the tablet user to remain connected with their telehealth care team, family, friends, and others that also have those applications.

Browse Popular Devices: https://smartselfreliance.org/smart-devices/tablet-pc/

Increased Housing Affordability

Living on a fixed income and annual increases in the cost of living pose a significant financial challenge for most people. These challenges are compounded by periodic home maintenance expenses, rising property taxes and the increasing cost of prescription drugs, healthcare insurance and medical services. Monthly utility bills also factor significantly into the affordability of housing.

Fortunately, because of recent innovations in information and communication technologies and the installation of smart meters in homes across the state, Illinois' largest utilities are now able to offer their customers multiple opportunities to reduce monthly utility bills. These include utility smart pricing programs, online customer accounts, energy efficiency programs and connected device services.

Smart Pricing Programs

Ameren Illinois and ComEd now offer their customers real-time or hourly pricing programs and peak time savings or reward programs. Brief descriptions of the programs are provided below along with phone numbers and links to utility websites where you can learn more and enroll.

Real-Time or Hourly Pricing Programs

These programs allow residents to purchase electricity at prices that vary by the hour based on the wholesale market price for electricity at each hour. Electricity prices are highest during peak hours of demand which are roughly from 10 a.m. to 9 p.m. during weekdays. Electricity prices then drop with demand at night and on weekends and are the lowest between the hours of 9 p.m. and 10 a.m. Customers who switch from fixed-rate pricing and enroll in these variable rate programs can save as much as 15% on their monthly electricity bills by operating major appliances such as washers, dryers, and dishwashers during off-peak hours when hourly prices are the lowest.

Customers enrolled in these programs also receive pricing alerts that notify them when hourly prices are expected to be higher than usual due to predicted excessive weather events which allows them to schedule operation of major appliances after those events.

Important Note: Although these programs provide real opportunities to save, they are not recommended for individuals who are dependent on electronic medical devices as their continuous operation during peak periods would cost more than their operation on a fixed-rate pricing program.

Peak Time Savings and Reward Programs

These programs allow enrolled customers to receive a credit on their energy bills for voluntarily reducing electricity usage during certain summer peak hours when energy consumption is predicted to be exceptionally high. These time periods or "Events" typically fall between 9 a.m. and 5 p.m. from June until September when air conditioning is in high demand.

Enrolled customers are notified the day before a predicted event by phone, email, or text (their choice). If they reduce their energy usage below their previously recorded usage during a similar period on a non-event day (the baseline), they will receive a credit. These credits are calculated at a certain dollar amount per kilowatt hour of energy reduced from the baseline for that time period.

On-Line Customer Account Programs

Ameren Illinois and ComEd now offer their customers the convenience and security of private online accounts where they can:

- Track their hourly, daily, and monthly energy consumption
- Establish a home energy profile and customize an energy efficiency plan
- Set-up phone, text, and email alerts of price changes and weather events
- Investigate a variety of energy efficiency strategies and tools, and
- Enroll in the programs described above

Energy Efficiency Programs

In addition to these programs, Ameren Illinois and ComEd offer a variety of traditional energy efficiency programs that can save their customers money. These include home energy assessments, energy efficient product rebates and discounts, free used appliance pick-up and recycling services, free weatherization services, and income-eligible programs offering no-cost energy efficient products and installation services.

Connected Device Services

These programs enable customers to wirelessly connect certain smart devices to their utility smart meters to access detailed electricity consumption and pricing information in near real-time. At the present time, most devices equipped with the wireless communication protocol, or language that allows them to communicate with the smart meter, are in-home displays, gateways (a device that sends smart meter data to a display), smart thermostats and range extenders that allow wireless devices to operate beyond the 50-foot distance limit from the smart meter.

Both Ameren Illinois and ComEd operate connected device services and both maintain a list of smart devices that are compatible with their smart meters. Their lists can be found on their websites through the links provided below and should be consulted before purchasing a product designed to use smart meter data.

- **Ameren Illinois:** https://www.ameren.com/
- **ComEd:** https://www.comed.com/WaysToSave/ForYourHome/Pages/Default.aspx

Accessibility Support

To control a smart device through a smartphone, tablet or laptop computer, it may only be necessary to use the accessibility features that are available on those mobile devices. However, depending on an individual's disability, it may also be necessary to use assistive technology (AT) tools. This section of the Guide describes each of these options and the services available through Illinois' Assistive Technology Program that enable all people with disabilities to improve their quality of life and participate fully in more aspects of life.

Command Device Accessibility

Command device accessibility features allow users to modify the appearance and operation of their smartphones and tablets to accommodate disabilities that would otherwise prevent them from being able to control smart devices. The features are found on both Apple iOS and Android devices and are described below.

iOS Accessibility Features

iOS is the operating system Apple uses for iPhones, iPads and iPod Touch. It supports more accessibility features than any other operating system on the market today, making Apple the accessibility leader in the mobile computing industry at the present time.

iOS Accessibility Features-Apps

	Visual	Hearing	Mobility
Siri	X	X	X
VoiceOver	X		
Audio Descriptions	X		
Dark Mode	X		
Display Accommodations	X		
Zoom	X		
Font Adjustments	X		
Magnifier	X		
Audio Magnifier	X		
Speak Screen	X		
Dictation	X		X
Accessibility Shortcuts	X		
iPhone and iPad Hearing Aids		X	
Live Listen		X	
Noise App		X	
Mono Audio		X	
RTT and Software TTY		X	
Visible and Vibrating Alerts		X	
FaceTime		X	

iMessage		X	
Closed Captions		X	
Voice Control			X
Switch Control			X
Platform Switching			X
Assistive Touch			X
Touch Accommodations			X
Keyboard Shortcuts			X
Predictive Texts			X
Hardware Keyboard Support			X

Visual Features

Apple has an impressive array of 11 accessibility features on its iOS devices for those who are blind or have low vision.

Siri

This feature is Apple's voice-activated digital assistant that can read and send text and email messages, turn on and off onboard apps and accessibility functions like Guided Access, Invert Colors and VoiceOver and answer practically any question you'd like to ask. It is particularly helpful to those that would prefer to operate their smart devices by voice command rather than by typing in a command on a smartphone or tablet screen. Guided Access is a feature that restricts user interactions within an app to avoid accidental commands.

VoiceOver

This is a screen reader feature that converts all text and images that appear on the screen of a mobile device into spoken word, in multiple languages and at any speed and pitch desired. This feature works with all iPhone apps and many third-party apps, as well. The system allows users to move their fingers across the screen and to click once to hear the name of the app and twice to open it up and to be able to scan the screen to hear its text and picture contents and press control command buttons.

Where typing is necessary in an app, for example to enter a Wi-Fi network name to pair the smart phone with a smart device app, the user can access the Siri microphone function. VoiceOver also supports the use of a companion refreshable Braille reader and keyboard allowing the user to both read and type required inputs. Other elements in VoiceOver ensure swift and accurate keyboard inputs, provide customizable commands, and help the user with pronunciation, and phrasing. Arguably, the use of VoiceOver, Siri and a companion Braille reader/writer, are the most effective means of using a smartphone or tablet to control the operation of smart home automation devices.

Audio Descriptions

This feature allows users to hear a description for all images, video, subtitle tracks and closed captioning that appears on a smartphone, as long as the content has been designed around accessibility guidelines. And with VoiceOver, closed captions and subtitle tracks can also be accessed through Braille displays.

Dark Mode
This feature inverts background and text colors to improve a user's ability to read. Instead of dark text against a white background, the text appears in white against a dark background. This mode works for Apple mail, the Safari Reader and iPhone apps like calculators and calendars. This mode is also compatible with other accessibility settings for contrast and transparency, as well.

Display Accommodations
This feature allows users with color blindness to adjust tint, hue, and grayscales and apply filters to screen images that make them easier to see and interpret. Another setting known as Smart Invert Colors enables the command device to recognize media such as graphics and movies rendered in dark colors and automatically reverses colors without changing the image itself. Once set up, this function applies to anything that is displayed on the screen.

Zoom
This feature allows the user to magnify anything that appears on the screen for a closer look. The feature increases image size from 100 to 1500 percent, has a picture-in-picture function and works on all onboard apps and any application that can be downloaded from the Apple App Store. This feature is also compatible with VoiceOver so that you hear anything that you zoom into, as well.

Font Adjustments
This feature increases the text size for all onboard apps such as messages, notes, settings, contacts and calendars and many third-party apps while maintaining the legibility of the display. The feature also permits a user to bold text making the text easier to see in all compatible apps.

Magnifier
This feature uses the command device's camera and flash function to magnify anything it is focused on and makes even the smallest text legible. The feature also has several filters that can be applied to increase the differentiation of colors.

Seeing AI App (Audio Magnifier)
Microsoft's "Seeing AI App" uses a mobile device's camera to identify people, objects, money, colors and more and then audibly describes them to persons with low vision or vision loss. This extraordinarily helpful app is provided by Microsoft free of charge.

Speak Screen
For those who would rather hear the content of email, iMessages, books, and apps instead of having to read them, this feature reads aloud whatever appears on the screen. It can be operated manually with a top-to-bottom two-finger swipe gesture and or turned on automatically with a Siri voice command. The voice speaking rate and dialect can also be customized on this feature.

Dictation
This feature allows a user to dictate an email, note or anything else that would otherwise be typed simply by clicking on a button and speaking into the command device's microphone. Once spoken, the feature automatically converts it into typed words and characters without the user ever touching the device.

Accessibility Shortcuts

The shortcut feature allows a user to create an on/off quick link for other accessibility tools and settings that you can access while you are using apps or reviewing web content without having to open the app itself.

For more information about Apple's vision accessibility features, visit:
https://www.apple.com/accessibility/iphone/vision/

Hearing Features

Apple has 10 accessibility features on its iOS devices for those who are Deaf or hard of hearing. A brief description of each follows along with a link to Apple's hearing accessibility features for more information.

iPhone and iPad Hearing Aids

This feature entails Bluetooth pairing of the iPhone and iPad with hearing aids that are designed to respond to home button clicks on those command devices to adjust sound quality settings and an audiologist's settings for a variety of environmental conditions found inside, outside and in noisy locations.

Live Listen

This feature pairs an iPhone with AirPods to help the user hear more clearly through the phone's microphone. This feature is particularly useful in noisy location where ambient sound makes it difficult to hear others in a conversation.

Noise App

Although this feature is not applicable to command device control of smart devices, it does contribute to overall well-being by monitoring and recording the sound decibel levels the user encounters and by identifying levels that are harmful to hearing.

Mono Audio

This feature is helpful to a user who is hard of hard of hearing in one ear that is listening
to media or website content through stereo headphones by ensuring that both right and left channels contain all of the recorded sound, rather than just the content programmed for each side. The feature also allows volume levels to be adjusted for each channel independently from the other.

RTT and TTY Software

The Real Time Text *(RTT) and Text Telephone (TTY) features allow people who are hard of hearing to use the telephone or a Braille display to type messages back and forth to one another in real-time instead of talking and listening. This feature also archives the call transcription in the phone app for later review.

Visible and Vibrating Alerts
This feature alerts a user to an incoming call text, FaceTime call and calendar events through a flashing LED light display or vibration. A variety of patterns are available, and a user can assign pictures to different callers.

Siri
The applicable Siri function for people who are hard of hearing is the "Type to Siri" mode that allows a user to ask a question or issue a smart device command by typing rather than speaking.

FaceTime
This feature provides high definition video-calling capability that has a frame rate fast enough to facilitate sign language communication between two or more persons who are Deaf or hard of hearing.

iMessage
This feature provides users the ability to engage in text exchanges that include video, photo and link attachments which support communication between all people and particularly those with hearing and speaking disabilities.

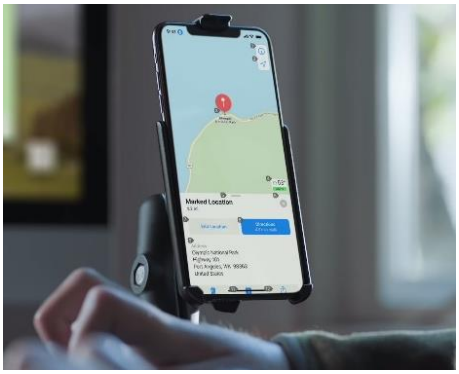
Closed Captions

This feature allows users to see captions and subtitles that track with the spoken word and sound in television broadcasts, movies, podcasts and in other media. Apple's VoiceOver feature, described above, translates closed captioned content for use with braille displays.

For more information about Apple's hearing accessibility features, visit:
https://www.apple.com/accessibility/iphone/hearing/

Mobility Features
Apple has 10 accessibility features on its iOS devices for those with mobility disabilities. A brief description of each follows along with a link to Apple's mobility accessibility features for more information.

Voice Control



This feature allows for voice control of all functions and apps on an iPhone or iPad. The feature also assigns numbered labels beside all clickable content that allows the user to navigate any app and issue precise commands by voice alone.

Switch Control

This feature allows a user with a physical motor disability to navigate and control an iPhone or iPad and any connected Bluetooth-enabled switch on a smart device through finger taps. This feature is paired with a tap strap device that attaches to each finger on one hand and sends a signal to the iOS device when it is tapped on the table. Each finger is assigned a different iOS device function (e.g., on, off, open, close, up, down, right, left, click) which responds to a tap. In this way, any user with a disability can use an iPhone, iPad or any other iOS command device to control a smart device.

Platform Switching

This feature allows the user to operate many devices synched to an Apple cloud account through just one device and is supported with the Switch Control feature described above. Therefore, any other iOS device registered to the same user can be operated through the same Switch Controlled device.

Siri

As stated above, this feature is Apple's voice-activated digital assistant that can read and send text and email messages, turn on and off onboard apps and accessibility functions like Guided Access, Invert Colors and VoiceOver and answer practically any question you'd like to ask. It is particularly helpful to those that would prefer to operate their smart devices by voice command rather than by typing in a command on a smartphone or tablet screen. And Siri Shortcuts allow a user to trigger the operation of several smart devices by speaking a customized command like: "leaving Home" which will turn down the thermostat, turn off the lights, unlock the doors, etc.

Dictation

As stated above, this feature allows a user to dictate an email, note or anything else that would otherwise be typed simply by clicking on a button and speaking into the command device's microphone. Once spoken, the feature automatically converts the input into typed words and characters without the user ever touching the device.

Assistive Touch

This feature allows a user to customize the touch screen layout and touch gestures to make an iOS device easier to use. For example, if pressing the Home button is a challenge, you can reach the Home screen through a tap anywhere on the screen or merely by rotating or shaking the device. This feature also allows a user to substitute a Bluetooth mouse in place of touch screen navigation and control.

Touch Accommodations

This feature allows the user to change how the iOS device touch screen responds to touch commands. This feature can be particularly helpful when a user may unintentionally tap the screen multiple times when trying to make a single selection and inadvertently triggers multiple screen responses. By adjusting the length of time, a single key must be pressed before the screen responds, shorter accidental taps are ignored and only the sustained touch receives a response.

Keyboard Shortcuts

This feature allows the user to type shortcuts to reduce the length of typing required to execute a command. For instance, a shortcut can be created to type your full home address by typing in HA. Shortcuts can be created for anything that is typed repeatedly.

Predictive Texts

This feature shortens the task of typing by predicting the words and phrases a user intends to write from just the first letter or word typed. The feature learns commonly typed phrases and suggests them from these first few inputs to shorten the number of letters you must type.

Hardware Keyboard Support

This feature includes Sticky Keys and Slow Keys. The first of these is designed to reduce movement associated with repetitive strain injury by serializing keyboard commands that require holding down two or more keys at the same time. For example, a Microsoft Word print command requires the user to press the ctrl and V commands simultaneously which can be a challenge for some. By activating Sticky Keys, the user can press each key in sequence to execute the print command. The Slow Key feature allows the user to specify the amount of time required for a keypress before the system will recognize it as an intended keypress. This feature eliminates the chance that accidental keyboard taps will register as intended keypresses.

For more information about Apple's accessibility features, phone 877-204-3930 or visit:
https://www.apple.com/accessibility/iphone/mobility/

Android Accessibility Features

The Android operating system is designed primarily for touchscreen mobile devices such as smartphones and tablets.

Android Accessibility Features-Apps

	Visual	Hearing	Mobility
TalkBack	X		
Braille Display	X		
Magnification	X		
Display Accommodations	X		
Magnification Gestures	X		
Font Adjustments	X		
Live Transcribe		X	
Live Caption		X	
Sound Amplifier		X	
Hearing Aid Support		X	

Switch Access			X
Voice Access			X

Visual Features
Android has 6 accessibility features on its devices for those with visual impairments. A brief description of each follows.

TalkBack

Google TalkBack

This is Android's version of the Apple VoiceOver feature that allows a user to navigate and control screen content through sound and touch. The feature uses screen reader software and adds haptic or vibration feedback to communicate device functions, options, notifications and alerts. It operates in the same way as the VoiceOver feature and has almost identical functionality.

Braille Display
This feature allows users to make a Bluetooth connection between a refreshable Braille display and any Android device and when paired with TalkBack, to benefit from combined speech and text communication.

Magnification

This feature is like Apple's Magnifier as it uses the command device's camera and flash function to magnify anything it is focused on making even the smallest text legible. The feature also has several filters that can be applied to increase the differentiation of colors.

Display Accommodations
Like Apple's operating system, this feature allows the users with color blindness to adjust color, tint, hue, grayscales and apply filters to screen images that make them easier to see and interpret. Other Android accommodations include customizable display and font size and spacing.

Magnification Gestures
This feature is like Apple's Zoom as it allows the user to magnify anything that appears on the screen for a closer look. The feature also increases image size from 100 to 1500 percent and works on all onboard apps and any applications that can be downloaded from the Play Store.

Font Adjustments
This feature increases the text size for all onboard apps such as messages, notes, settings, contacts and calendars and many third-party apps too while maintaining the legibility of the display. The feature also permits a user to bold text making it easier to see in all compatible apps.

For more information about Android's vision accessibility features, visit:
https://www.android.com/accessibility/

Hearing Features
Android has 4- accessibility features on its devices for those with hearing loss. A brief description of each follows.

Live Transcribe

This feature provides instantaneous captioning of anything that is spoken in 70 languages and dialects. It utilizes Google's speech recognition technology that can pick up subtle differences to produce accurate captioning of what is being spoken. This system was developed in consort with Gallaudet University, the nation's noted school for the Deaf and hard of hearing.

Live Caption

This feature automatically applies captions to videos, podcasts and any other media that is playing on an Android mobile device like a smartphone or tablet.

Sound Amplifier

This feature pairs with earphones or wired headphones and significantly increases the volume and filters out background noise to improve a user's ability to hear more clearly.

Hearing Aid Support

Like Apple, Google has partnered with hearing aid designers and manufacturers to improve their sound quality and functionality and enable them to receive streamed audio content from an Android device, such as phone calls, music or any other media. This entails the use of a new Android smartphone operating protocol known as the Audio Streaming for Hearing Aide or "ASHA" specification. Regarding its relevance to command control over smart devices, this new protocol will allow users of hearing aids to receive any streaming audio communication from a related app.

For more information about Android's hearing accessibility features, visit:
https://www.android.com/accessibility/

Mobility Features
Android has 2-accessibility features on its devices for those with mobility disabilities. A brief description of each follows.

Switch Access

This feature enables a user to navigate and control an Android device through the use of an external switch device such as a joystick, touch pad or tap strap (described above) instead of through the touchscreen or a conventional keyboard. This feature allows the user to assign customizable actions to the external switch components so that all Android mobile functions and all companion apps are accessible, including smart device control apps.

To learn more, visit:
https://support.google.com/accessibility/android/answer/6122836?hl=en

Voice Access
This feature assists users with paralysis, tremors or temporary injuries, navigate and control their Android device, and their connected smart devices through voice command in place of a touch screen or keyboard. This feature is only available in English at the present time.

For more information about Android's mobility accessibility features, visit:
https://www.android.com/accessibility/

Assistive Technology Software & Hardware

Although the iOS and Android accessibility features will provide some users improved ability to operate their mobile command devices, others will require additional assistive technology (AT) support. This section describes a select set of effective AT tools that support users with visual, hearing, speech and mobility disabilities and provides links to follow for additional details and purchase information.

For more information, contact the Illinois Assistive Technology Program at 217-522-7985 or visit their website and their searchable Device Loan Inventory under the "Device Category" drop down menu at: https://deviceloan.iltech.org/SearchInventory.aspx

Visual Support

Challenge

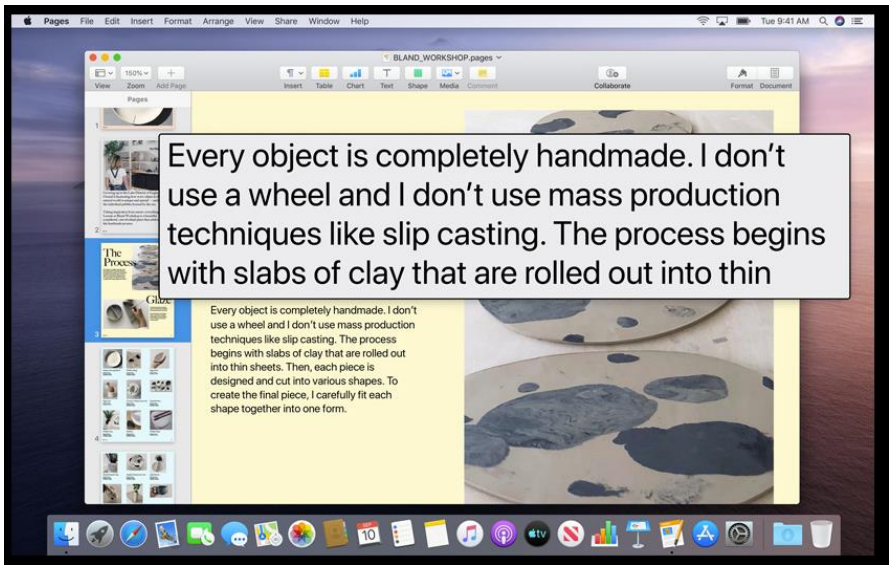
The ability to see the screen on a mobile device or computer greatly simplifies their operation and thereby the operation of a smart device app, as well. Fortunately, assistive technology software and hardware have been developed to provide users who are blind and low vision full access to the content contained on mobile devices or computer screens.

Visual Support AT Software & Hardware

Screen Readers

Application	Operating System	Free	Fee Based
NVDA	Windows	X	
Windows Narrator	Windows	X	
Serotek System Access	Windows	X	
WebAnywhere	Windows	X	
Apple VoiceOver	OS X	X	
ORCA	Linux	X	
BRLTTY	Linux	X	
Emaspeak	Linux	X	
ChromeVox	Google Chrome	X	
Job Access with Speech (JAWS)	Windows		X
Dolphin Screen Reader	Windows		X
Cobra	Windows		X
System Access	Windows		X

Screen Readers



These are software and hardware tools that convert text on a computer screen into audio or tactile output such as Braille. In the case of audio outputs, the software applies optical character recognition and a synthetic voice to read aloud the screen contents to the user. In the case of Braille output, the software converts text into data that is sent to a refreshable display utilizing crystals that expand when voltage is applied to form tactile dot patterns that users with visual impairment can touch to read. Refreshable Braille displays can be quite expensive.

Many basic screen reader software products can be downloaded free of charge from the Internet. However, it should be noted that many basic screen readers do not allow users to navigate computer screens or browse the Internet which is necessary to operate smart device applications. Most software apps for purchase do provide users these additional features and much greater independence as a result. Several free screen readers and those for purchase are listed below along with a related app that is relevant to smart device set-up by users with visual impairment. Links to additional product detail and purchase information are also provided.

Free Screen Readers:

- NVDA (Windows) – https://www.nvaccess.org/
- Narrator (Windows) – https://support.microsoft.com/en-us/help/22817/windows-10-narrator-introducing
- Serotek System Access (Windows) – https://www.satogo.com/en/
- Apple VoiceOver (OS X) – https://www.apple.com/accessibility/mac/vision/
- ORCA (Linux) – https://wiki.gnome.org/Projects/Orca
- BRLTTY (Linux) – http://mielke.cc/brltty/
- Emaspeak (Linux) – http://emacspeak.sourceforge.net/
- ChromeVox (Google Chrome) – bit.ly/36LnhxG
- WebAnywhere (Windows) – https://webinsight.cs.washington.edu/wa/

Subscription Screen Readers:

- Job Access with Speech (JAWS) (Windows) – https://www.freedomscientific.com/products/software/jaws/
- Dolphin Screen Reader (Windows) – https://yourdolphin.com/en-gb/products/individuals/screen-reader
- Cobra (Windows) – http://www.bayareadigital.us/products/baum/cobra.html
- System Access (Windows) – http://www.serotek.com/systemaccess
- ZoomText (Windows) – https://www.zoomtext.com/products/zoomtext-magnifierreader/

Audio Magnifiers

An extremely useful app for users with visual loss is an audio magnifier. This app applies optical character recognition and artificial intelligence to enable the user to access a mobile device's camera to scan text, objects, products, people and anything else around them to hear the app read aloud what the camera sees. This app would be useful in scanning smart device box labels and installation instructions during set-up. *Envision AI* by LetsEnvision is a popular version of this app. To find more details and for subscription information, please visit: https://www.letsenvision.com/

Hearing Support

Challenge

Several smart devices such as smoke and carbon monoxide alarms, doorbells and security systems use audible alerts to notify users when a hazard is present in the home. This can present a challenge for users with hearing loss, so hearing aids and augmented hazard alarms are extremely important assistive devices to consider.

Smart Hearing Aids

Smart hearing aids are growing in popularity as they can be an effective treatment option for people experiencing varying degrees of hearing loss. These devices automatically filter out background noises to enhance the desired sound in real-time making the restoration process as immediate and natural as possible. While most smart hearing aids have controls for manual adjustments, AI-enabled devices can learn the user's listening preferences over time. Smart hearing aids can then begin to adjust automatically with advanced machine learning algorithms. This may help minimize the need for human intervention, and even eliminate it over time. Users can also control smart hearing aids wirelessly through smartphone apps to adjust the device according to user preference.

In addition to smart hearing aids, there are now personal amplifiers that can be worn with earbuds or headphones.

Several smart hearing aids and personal amplifiers for 2020 are listed below along with links to additional product and purchase information.

Smart Hearing Aids

- Eargo – www.theseniorlist.com/hearing-aide/best/#Eargo
- Lively – www.listenlively.com/
- Widex – www.widex.com/en-us
- Signia – www.signiausa.com/
- Phonak – www.phonak.com/us/en/hearing-aids.html
- Oticon – www.oticon.com/

Personal Amplifiers

- The Pocket Talker – www.williamsav.com/pocketalker-personal-amplifier/
- Comfort Duet – www.williamsav.com/pocketalker-personal-amplifier/
- Mino – www.harriscomm.com/mino-personal-amplifier-from-bellman-symfon-with-earphone.html

Augmented Hazard Alarms

In addition to smart hearing aids, several home security and hazard mitigation devices now feature flashing strobe lights to augment the conventional audible alerts that enable their use by people with hearing loss. These include security systems, smoke and carbon monoxide alarms and doorbells and monitors.

Several augmented hazard alarms for 2020 are listed below along with links to additional product and purchase information.

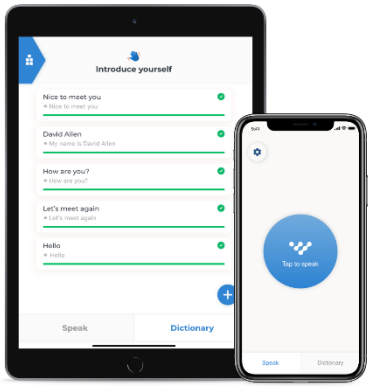
- SafeHome – https://www.safehome.org/security-systems/best/deaf/
- Daily HomeSafety – https://dailyhomesafety.com/
- NFPA – https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Specific-groups-at-risk/
- Hearing Sound Advice – http://www.hearingsoundadvice.com/
- First Alert – https://www.firstalertstore.com/store/products/

Speech Support

Challenge

Increasingly, voice-command is becoming the most convenient, effective, and popular means of accessing the Internet and controlling connected smart home automation devices. For many people with disabilities, devices such as Amazon's Alexa, Google's Assistant and Apple's HomePod have taken the place of environmental control units and device hubs that preceded them. However, their voice recognition/voice-to-text systems all require the use of "standard speech", leaving individuals with speech impediments or the inability to speak unable to use them. Fortunately, there are now translation apps and speech generating devices that can overcome the communication barriers.

Speech Translation Apps



Software now exists that enables anyone with a speech impediment to “Speak” with the English pronunciation that any voice recognition driven device can understand and respond to. One example of this software for iOS devices is Voiceitt. It allows the user to record basic phrases that it learns from and then translates their pronunciation into speech that it plays through an iPhone or iPad speaker or converts into text messages. JABtalk performs a similar function for the Android platform.

Several speech translation apps for 2020 are listed below along with links to additional product and purchase information.

- Voiceitt – www.voiceitt.com
- JABtalk – https://jabstone.com/
- Talkitt – https://www.talkitt.com/
- Predictable AAC app – https://www.iaccessibility.com/apps/speech/

Speech Generating Devices

For persons without the ability to speak, speech generating devices will be necessary in order to operate a voice-activated assistant. These are augmentative and alternative communication (AAC) systems, also known as voice output communication aids, that enable those with complete speech disabilities to communicate verbally. Some of these devices utilize digitized recordings of natural speech that correspond to symbols on a screen or physical board that users can tap to communicate common words and phrases. Others use speech synthesis which translate either direct or indirect user inputs into spoken language. Direct inputs are made on a keyboard or touch screen while indirect inputs are made on a switch access scanner, joystick, optical head pointer, infrared pointer or eye gaze technology described below.
Several speech generating devices for 2020 are listed below along with links to additional product and purchase information.

- GoTalk Express 32 Speech Generating Device – www.attainmentcompany.com
- Smart/128 VSD Communication Device – www.schoolhealth.com
- Textspeak AAC Speech Generation – www.alimed.com/textspeak
- QuickTalker Freestyle – www.quicktalkerfreestyle.com/

Mobility Support

Challenge

Mobility disability caused by amputation or paralysis resulting from nerve damage to the brain and/or spinal cord, can make conventional use of a keyboard, mouse, or touch screen, difficult if not impossible. As a result, operating a smart device is difficult or impossible, as well. Fortunately, there are many assistive technology devices that overcome this mobility challenge. These include adaptive keyboards, adaptive switches, digital assistants, and eye gaze systems.

Adaptive Keyboards

These devices are designed to make physical and on-screen keyboards easier to use for anyone with a mobility, visual or cognitive disability. Physical keyboards typically feature larger keypads, sticky keys, more accessible key configurations, key covers to improve the accuracy of keystrokes, and the elimination of the numeric keypads to provide more space for companion adaptive mice. On-screen keyboards utilize the free Windows keyboard and software that allows use of adaptive switches and eye gaze systems. Additional adaptive on-screen keyboard software is also available from several developers.

Several adaptive keyboards apps and devices for 2020 are listed below along with links to additional product and purchase information.

- KeyGuards – https://www.ablenetinc.com/bigkeys-lx-rigid-keyguard
- Compact Keyboard – https://www.bestbuy.com/site/shop/compact-keyboards
- BigKeys – https://www.ablenetinc.com/bigkeys-lx-rigid-keyguard
- Clicker – https://www.bestbuy.com/site/shop/compact-keyboards
- ACAT – https://01.org/acat/

Adaptive Switches

Adaptive switches and companion iOS and Android apps enable a user to operate a smartphone, tablet, or computer (mobile devices) by pressing a physical button on a Bluetooth device with a hand, foot, leg, forehead or chin, or even by inhaling and exhaling. These are particularly helpful for individuals with limited arm and hand movement and control. All of these switches operate essentially the same way.

The tapping of a button, or in one case, air pressure, brings two metal surfaces together completing a circuit that transmits a radio signal to the mobile device's receiver that, through the app, allows a user to control that device. The type of adaptive switch that will be most appropriate for a

user will depend on that individual's ability to control different parts of their body. Examples of these adaptive switches are described further below.

- Micro Light Switch – This wired adaptive switch activates with exceptionally light pressure on a finger pad and provides both audible and vibrating feedback that the switch signal was successful.

- Buddy Button – This wired adaptive switch has a large button that a user can activate with an open palm, fist, head, elbow, or foot and has a loud audible indicator that the switch has been activated. They come in a variety of colors and can be mounted on practically any surface with Velcro.

- Pillow Switch – Like a Buddy Button, a pillow switch is an adaptive switch with a soft pillow-like cushion that makes it comfortable to use when activated by a user's forehead, cheek, or chin.

- Chin Switch – This wired adaptive switch is attached to a plastic collar that positions it where the chin hits the upper chest when users bow their heads. When they do, the chin can depress the button to operate any connected device.

- Joystick – This is a handheld device featuring a stalk that pivots in multiple directions, often with one or more button switches, that serves the same function as a mouse to navigate a computer screen and control apps.

- Trackball Mouse – Serving the same function as joystick, the trackball mouse is a device with a ball in a socket with a ring of sensors that detect its movement. Users can use their two fingers, hands or open palm to roll the ball which sends switch signals to the mobile device that control the screen's cursor.

- Foot Mouse – Like joystick and trackball mice, this device features conventional tap switches on a panel that a user controls through footsteps.

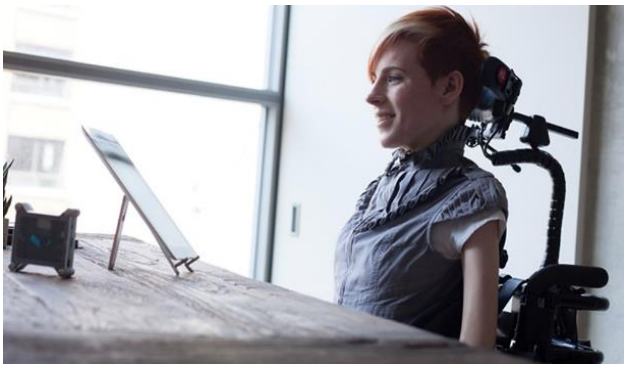
- Sip and Puff – This adaptive switch allows users the ability to send signals to a connected mobile device using air pressure created by sipping (inhaling) or puffing (exhaling) into a straw, wand or tube. The mouthpiece is connected to a flexible gooseneck that can be positioned for maximum comfort.

- Jouse3 – This is an adaptive joystick switch that a user can operate with the mouth, cheek, chin, or tongue. The switch also combines a sip and puff function to perform right-click, left-click and double-click functions. The device comes with a software program that emulates a computer keyboard enabling the user to type using the sip and puff function.

- Pererro iOS Switch Adapter – This plug and play adapter allows a user to operate all Apple iOS devices without the need to touch a keyboard or screen. Once activated, it allows users to operate all of the functions of a device through their preferred adaptive switch including reading and writing emails and text messages, scanning and pointing to options on a smart device control application, listening to music and playing games.

To learn more about these adaptive switches and where to purchase them, please visit: AbelNet at: https://www.ablenetinc.com/

Tecla



This is a cloud-based device that enables users to control multiple touch-face devices through their preferred assistive switches. The companion app, Tecla-e, gives users the ability to send simple text messages, place phone calls and to control up to 8 mobile and smart home devices. To learn more about Tecla and to purchase it, please visit: Tecla at: https://gettecla.com/

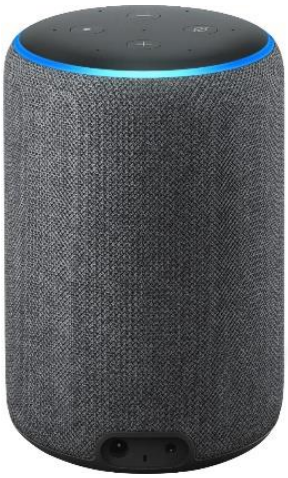
Eye Gaze Devices

Unlike adaptive switches, eye gaze devices use advanced camera and electronic screen technology instead of electromechanical devices to send signals to command devices such as smartphones, tablets and computers. The camera technology entails accurate mapping of eye movements to an onscreen grid containing screen commands and buttons that the user can activate by merely focusing on them. This advanced technology allows those with only the ability to move their eyes to access the Internet and to operate most smart home automation devices.

Several eye gaze systems for 2020 are listed below along with links to additional product and purchase information.

- Tobii Dynavox Eye Gaze Systems – https://us.tobiidynavox.com/
- WinSlate 12 with Enable Eyes – https://www.forbesaac.com/winslate-12-enable-eyes
- The PRC Look – https://www.prentrom.com/prc_advantage/eye-tracking-and-access-technologies
- Neuronode Trilogy – https://sayhello.controlbionics.com
- Imotions Eye Tracking – https://imotions.com/eye-tracking/
- VisuALS – https://visuals.tech/stroke-communication/

Digital Assistants



For those able to speak, or for those able to simulate speech, a digital assistant is likely the most efficient and convenient way to control one or more smart devices. Amazon's Echo, Google's Assistant and Apple's HomePod all use advanced voice-to-text, voice recognition software and algorithms to respond to practically any question or command a user can speak. This extraordinary capability and its comparatively reasonable pricing ($40 and up) make the digital assistant one of the most popular and useful devices on the market today.

Several of the most popular digital assistants for 2020 are listed below along with links to additional product and purchase information.

- Amazon Echo – https://www.amazon.com/all-new-Echo/dp/B07R1CXKN7
- Google Assistant – https://assistant.google.com/
- Apple HomePod – https://www.apple.com/homepod/

Environmental Control Units

Prior to the arrival and popularity of digital assistants such as Amazon's Echo, Google's Assistant and Apple's HomePod, environmental control units were the preferred whole home smart automation solution for people with disabilities. These devices allow a user to control multiple smart devices with a single control panel and through a most of the adaptive switches and eye gaze devices described above.

Several environmental control units for 2020 are listed below along with links to additional product and purchase information.

- Special Needs Computers – https://www.specialneedscomputers.ca/
- NanoPac – https://nanopac.com/
- Quartet Technologies Touchscreen – https://qtiusa.com/
- Zygo Primo Touchscreen – https://www.zygo-usa.com/usa/index.php/aids-to-daily-living/primo-touchscreen-ecu-detail
- Advanced Mobility's Pilot Pro – https://www.advancedmobilityus.com/product/pilot-pro/

Assistive Technology Services

The single best source of assistive technology information and resources in Illinois is the Illinois Assistive Technology Program (IATP). A statewide, non-profit organization, the IATP's mission is to: "Increase access to and the acquisition of Assistive Technology devices and services for individuals of all ages with disabilities." The organization is funded under the Assistive Technology Act of 2004 and through the Illinois Department of Human Services, Division of Rehabilitation Services.

IATP Services

The organization provides the following assistive technology services:

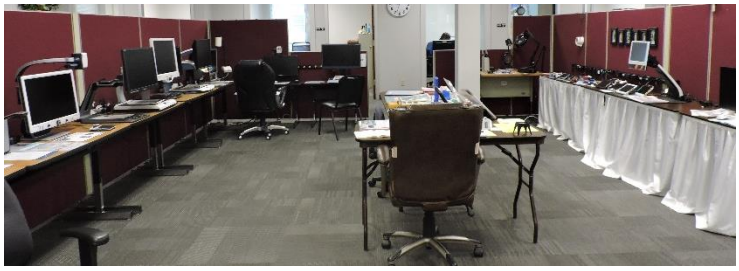
- Demonstrations of assistive technology
- Loans of AT devices
- State financing for assistive technology
- A device reutilization service
- Training and technical assistance, and
- AT policy development and advocacy

In addition to operating an AT demonstration center at its Springfield, Illinois location with devices for every conceivable need, IATP allows a person with a disability to borrow and try an AT device for up to five weeks at no cost (except for return shipping). To aid in device selection, the organization also maintains a searchable device inventory that can be reached at: https://deviceloan.iltech.org/SearchInventory.aspx

The organization's ATLOAN$ enables qualifying Illinois residents and their authorized representatives to finance the purchase of AT devices. The program can support loans from $1,000 to $30,000 although necessary home modification loans are capped at $5,000. The program also provides "Credit Builder Loans" for persons with poor credit as a means of using the device loan to rebuild credit. These loans are available for assistive technology purchases between $250 and $1,000.

For more information or to apply for a loan, please visit: https://www.iltech.org/repository/financialloans

For assistance with device selection and training, the organization operates two targeted AT evaluation programs. The Assistive Technology and Augmentative and Alternative Communication (AT/ACC) evaluation program assists Illinois school districts in planning and performing AT and ACC evaluations at no charge on a first come first serve basis. The organization employs Assistive Technology Specialists (ATS) that provide AT evaluations for customers of the Illinois Department of Human Services, Division of Rehabilitation Services and they can also provide training on individual AT device operation and maintenance.



To learn more about the many other services available through IATP, contact them at (217) 522-7985 / v/TTY:(800) 852-5110 or visit their website at: https://www.iltech.org/

Smart Device Selection & Installation

Smart Device Selection

The first step in selecting an appropriate smart device is an assessment of your short-and long-term needs for independent living. Consider conducting a daily activities approach to thinking through challenges you may encounter on a room-by-room basis. The following 10 questions will help with the assessment:

1. What challenges or limitations do you currently experience or anticipate experiencing with activities of daily living?

2. How might these challenges and limitations changes in the next 2-5 years, 6-10 years, and beyond?

3. What smart devices would help meet those challenges?

4. What assistive technology would be necessary to operate them?

5. What are the additional costs of home adaptations/modifications, and AT related to the device?

    - AT devices
    - Installation
    - Batteries
    - Other necessary equipment to operate the system

6. Will the device be compatible with other smart devices?

7. Are product rebates available?

8. Has the device(s) earned favorable reviews and ratings?

9. What is the projected life expectancy of the device? What is the warranty?

10. Is the price within my budget? Is this a one-time cost or will there be future costs or monthly fees to maintain and/or upgrade?

Important Note: The authors recommend that consumers be cautious about purchasing devices from third-party vendors that are not authorized to distribute the desired device. Many consumers have discovered, the hard way, that some vendors selling devices on Amazon are not authorized distributors, though they may appear to be, and as a result, they are often selling outdated products and apps that the original equipment manufacturer (OEM) no longer support. Avoid this pitfall by going to the OEM website to find an authorized distributor and then to that entity's website to make the purchase.

Smart Device Installation

The Smart Self Reliance Initiative has developed a series of self-install instructional videos for seven of the most helpful devices for independent living. Each of these 10- to 15-minute videos describe the purpose, function and features of the device and provide step-by-step instruction on initial set-up, online activation and use of the companion application (app). The videos also describe the device's accessibility settings, safety and maintenance and troubleshooting.

The seven devices include the following:

Personal Assistant
Google Home Mini
https://store.google.com/us/product/google_nest_mini

Smart Light Bulb
Wyze Smart Light Bulb
https://wyze.com/wyze-bulb.html

Smart Plug
TP-Link Kasa Smart Wi-Fi Plug (HS100)
https://www.amazon.com/dp/B0178IC734?tag=digitren08-20&linkCode=ogi&th=1&psc=1&ascsubtag=1583857523291ffuh

Smart Doorbell
Ring Video Doorbell with HD Video, Motion Activated Alerts
https://www.amazon.com/Ring-Wi-Fi-Enabled-Doorbell-Nickel/dp/B00N2ZDXW2

Smart Smoke & Carbon Monoxide Monitors
Roost Wi-Fi battery for smoke and CO alarms
https://shop.getroost.com/collections/homepage/products/roost-smart-battery'

Smart Thermostat
Nest Leaning Thermostat
https://nest.com/

Indoor Air Quality Monitor & Air Purifier Outlet
Awair Glow C Air Quality Monitor + Integrated Smart Plug
https://www.amazon.com/s?k=Awair+Glow+C&i=amazon-devices&ref=nb_sb_noss_2

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ISEIF Illinois Science & Energy Innovation Foundation

Christopher & Dana Reeve Foundation
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Sponsors & Authors

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Appendix

Appendix A: Primary Internet Service Providers in Illinois

The information provided here includes only Internet Service Providers. Prices do not include taxes and may not reflect additional fees. Please note that some providers listed below offer plans that bundle Internet service, television, and telephone service at discounted rates.

Access AT&T (cable, DSL) provides Internet access to residents on a limited income at the maximum speed available at the address. The plan offers 5Mbps-10Mbps for $10/month and 768 Kbps-3Mbps for $5/month. The maximum monthly data plan is150GB or 1TB of data per month depending on the type and speed of service you receive. If you exceed your monthly data plan allowance, you will be charged $10 for each 50GB of data usage in excess of your data plan, even if less than 50 gigabytes are used. The service includes free installation and free in-home Wi-Fi. For more information and to apply, please visit: https://www.att.com/shop/internet/access/#!/

CenturyLink (fiber) plans start at $49/month for 100 Mbps or the fastest speed available at your home but this rate requires paperless billing. No contract is required, and rate will not increase if you keep your plan. Additional fees may include a modem with a $15/month fee or purchase at $150 and a $5 fee is added to the Wi-Fi service. You have the option to self-install the modem or pay a technician installation fee. For more information, please visit: https://www.centurylink.com/home/

Charter Spectrum Internet 100 (cable) offers a plan at $49.99/month with unlimited data and maximum download speeds of up to 100Mbps. After one year of service, the plan's price increases; however, a contract is not required so you have the option of searching for a different low-cost plan. For more information, please visit: https://spectrumspecial.com/internet.html

Frontier (DSL) plans start at $20/month for the Simply Broadband Core for 6 Mbps with a 2-year contract. Discounts are offered to households with an annual income of less than $20,000. For more information or to apply, please visit: https://frontier.coml

RCN (fiber) plans are available in Chicago and offer plans for $49.99/month for 1Gbps with no contract required; however, introductory offers may be available. For more information, please visit: https://www.rcn.com/chicago/

HughesNet (satellite) is available for customers living in rural areas as long as there is a clear view of the southern sky. Due to the satellite connection, the service may be at a slower speed. The plans start at $50/month for 25 Mpbs with a 2-year contract. For more information or to apply, please visit: https://www.hughesnet.com

Suddenlink (cable, fiber) offers a plan starting at $34.99/month for 1 year for 100 Mbps. No contract is required. For more information or to apply, please visit: https://www.suddenlink.com/

Verizon Fios (fiber, DSL) offers a plan starting at $39.99/month for 200 Mbps with no contract required and no data cap; however, to qualify for the monthly price you must enroll in autopay. For more information, please visit: https://www.verizon.com/home/fios-fastest-internet/

Viasat (satellite) is a satellite plan for customers located in rural areas. The Basic 25 plan is $50/month (for two years) for 25 Mbps and unlimited data during off-peak hours. Outside of the "free zone," the data is limited to 12GB. For more information, please visit: https://www.viasat.com

Windstream Enhanced Kinetic Internet (DSL) offers a 1-year plan for $36/month for 200Mbps with unlimited data. After 1 year, the price increases to $45/month. There is a $35 upfront fee; however, no contract is required. For more information, please visit: https://www.windstream.com/premium-speed

Xfinity (cable, fiber) plans start at $20/month with a 1-year contract for 25 Mbps. A paperless bill and automatics payment are required to qualify for this price. For more information, please visit: https://www.xfinity.com/learn/internet-service

Internet Service Provider/Plan Summary - September 2020

Provider/Plan	Plan Type	Data Allowance	Speed	Price	Contract Required
Access AT&T	Cable, DSL	150GB or 1TB	768 Kbps-10 Mbps	$5-$10/month (low income discount)	No
CenturyLink	Fiber	Unlimited	100 Mbps	$49/month	No
Charter Spectrum Internet 100	Cable	Unlimited	100 Mbps	$49.99/month for 12 mo. +$49.99 upfront fee	No
Frontier	DSL	Not Provided	6 Mbps	$20/month (low income discount)	Yes
RCN (Chicago area only)	Fiber	Unlimited	1 Gbps	$49.99/month	No
HughesNet	Satellite	Unlimited	25 Mbps	$50.00/month	Yes
SuddenLink	Cable, Fiber	Unlimited	100 Mbps	$34.99/month	No
Verizon Fios	Fiber	Unlimited	200 Mbps	$39.99/month with autopay & equipment charges	No
Viasat Exede Basic 25	Satellite	Unlimited during off peak hours	25 Mbps	$50/month +$99.99 upfront fee	Yes
Windstream Enhanced Kinetic Internet	DSL	Unlimited	200 Mbps	$36/month for the first 12 mo. then $45/mo +$35 upfront fee	No
Xfinity	Cable, Fiber	Unlimited	25 Mbps	$20/month paperless bill and automatics payment required	Yes

Additional Resources for Internet Service Providers

Whistleout is a website that allows you to make comparisons of Internet plans and providers available in your area. To review the site, please visit: https://www.whistleout.com/Internet

To examine which Internet connection and plan is best for you, please visit: https://www.whistleout.com/Internet/Guides/home-internet-types

See the following resources for providers by connection types:

Cable : https://www.whistleout.com/Internet/Cable-Internet

DSL: https://www.whistleout.com/Internet/Best-DSL-Internet

Fiber: https://www.whistleout.com/Internet/Best-Fiber-Internet

Mobile or Wireless: https://www.whistleout.com/Internet/Best-Wireless-Internet

Satellite: https://www.whistleout.com/Internet/Satellite-Internet-Plans-Packages

Appendix B: Popular Smart Devices, Features & Pricing

(Pricing as of September 2020)

Smart Occupancy Sensors

Name	Features	Price Range
BeSense Zwave Ceiling PIR Motion Detector	Ceiling motion detector alerts connected technologies when someone is in the home. Connects to smart hubs to activate programmed home controls such as lighting and temperature.	$25 - $30
Nest Tag	Touch the device to disarm your Nest-connected alarm system to alert the home of occupancy.	$20 - $30
Philips Hue Motion Sensor	Wall mounted or freestanding device which controls lighting when someone walks into or leaves a room.	$35 - $45
Samsung SmartThings Arrival Sensor	Receive an alert to your smart device when someone arrives at or leaves your home. This device can also be programmed to trigger lights or locks when a person arrives at or leaves the home.	$15 - $20
Wink Door Window Sensor	Alerts your Wink Hub if doors and windows are opened, notifying the user through the Wink App if anyone has entered the home.	$25 - $35

Smart Cameras & Monitors

Name	Features	Price Range
Amazon Cloud Security Cam	Captures video surveillance of home when away. Gives notifications of activity through a mobile app or website. Provides the viewer with two-way audio.	$115 - $125
GE Wireless Digital Camera	Provides Wi-Fi activated smart security monitoring for indoor or outdoor the home. Connects to other Wi-Fi enabled technologies such as a smartphone to provide video surveillance.	$80 - $125
Piper nv Smart Home Security System with Night Vision	Video home security system that sends alerts to a smartphone when there is unsuspecting motion or activity.	$195 - $205

Smart Smoke & Carbon Monoxide Detectors

Name	Features	Price Range
Honeywell Xiaomi Mijia Alarm	Provides remote alerts to connected technologies and smartphones when smoke is detected in the home.	$30 - $40
First Alert Oneline Safe & Sound Smart Hardwired Smoke & Carbon Monoxide Alarm	Alerts smart device through the Onelink app if there is a detection of smoke or carbon monoxide in the air. Has a built-in Amazon Alexa.	$245- $255
Leeo Smart Alert Smoke/Carbon Monoxide Remote Alarm	Monitors existing smoke, carbon monoxide, and water alarms and alerts you via smartphone app or phone call if there are issues. Can alert friends, family, and local emergency services of emergency detections.	$95 - $105
Nest Protect Smoke and Carbon Monoxide Alarm Battery	Connects through Wi-Fi to Smart Home Technologies to alert user of smoke and/or carbon monoxide in the air.	$115 - $125
Samsung SmartThings ADT Smoke Alarm	Alerts connected technologies when there is smoke or high temperatures in the home. Has the option of connecting with ADT services and professional monitoring. Requires use of an ADT Security Hub.	$70 - $80

Smart Leak Detectors

Name	Features	Price Range
Flo Leak Detection System	Provides remote automatic water shutoff through a smart phone app, gives alerts to a smartphone when maintenance is needed and performs daily tests to detect leaks and identify issues.	$490 - $500
Floodie	Sends immediate alerts to a smart phone when the device detects leakage or floods.	$85 - $95
Honeywell Lyric Wi-Fi Water Leak Detector	Alerts smartphone when the device detects a water leak or freeze. Connects to home Wi-Fi.	$65 - $85
Samsung SmartThings Water Leak Sensor	Alerts smartphone when the device detects excess water.	$20 - $30
Wasserstein Smart Wi-Fi Water Sensor	Alerts smartphone when there is a present or potential water leak in a home. Connects to home Wi-Fi and provides information via the Wasserstein app on smartphones.	$25 - $55

Smart Doorbells

Name	Features	Price Range
Nest Hello Doorbell Camera	Doorbell camera to view and interact with visitors at the door. Can view and talk to people from your smartphone or other device.	$225 - $235
Ring Video Doorbell	Connects with Alexa and smartphone or tablet for Wi-Fi activated security. Has a camera to hear, speak to, or see anyone at the front door.	$95 - $500

Smart Door Locks

Name	Features	Price Range
ADT Pulse	Smart home security that allows remote arming/disarming of home security via app. Provides security alerts and notifications as specified.	Remote: $52.99/month; Video: $59.99/month
Amazon Cloud Security Cam	Captures video surveillance of home when away. Gives notifications of activity through a mobile app or website. Provides the viewer with two-way audio.	$115 - $125
August Smart Lock	Lock and unlock your door with keyless access to entry with your phone.	$120 -255
Nest Hello Doorbell Camera	Doorbell camera to view and interact with visitors at the door. Can view and talk to people from your smartphone or other device.	$225 - $235
Ring- Floodlight Cam	Outdoor lighting system that turns on flood lights at the detection of motion while also alerting a mobile device.	$245 - $255

Smart Plugs

Name	Features	Price Range
Belkin Smart plug	Connects with Alexa and Google assistant to provide remote control of technologies.	$25 - $35
Geeni Spot Smart Plug – Single plug	Control technologies through Google Assistant, Amazon Alexa, voice control, or through Wi-Fi connectivity to smart device.	$15 - $25
Kisslink Mini Smart Plug Mini	Connects with Alexa, iOS, and Android to provide remote control of Smart Home Technologies via smartphone or device	$10 - $25
Mini Smart plug (Amazon)	Connects with Alexa and Google Smart home.	$10 - $20
youxiu smart plug (Amazon)	Connects with Alexa, iOS, and Android to provide remote control of Smart Home Technologies via smartphone or device.	$10 - $20

Smart Lighting & Dimmer Controls

Name	Features	Price Range
Cree LED Lightbulb – 4 pack	When connected to a hub, can turn on, off, and dim from remote locations via connection.	$15 - $20
LIFX Mini Wi-Fi Smart LED Light Bulb – 1 pack	Connects to compatible technologies (Alexa, Android, iOS) to allow for remote control of lighting, dimming, and timing of lights.	$20 - $40
Lutron Caseta Wireless Smart Lighting Dimmer Switch – 2 pack	Connects to compatible technologies (Alexa, Android, iOS) to allow for remote control of dimming and usage of lighting.	$155 - $190
GE C-Sleep Lightbulb – 4 pack	Connects with Amazon Alexa or Google Assistant to control lighting from remote locations. Ability to group bulbs to control many at once. No hub required.	$65 - $75
Philips Hue – 4 pack	Automated light control from home or away via app, or other Smart Technology such as Echo or Nest.	$175 - $200

Smart Thermostats

Name	Features	Price Range
Honeywell	Adjust temperature from a remote location via computer, tablet, or smartphone; creates energy savings, touchscreen, large panel visual, connects to Amazon Alexa for voice control.	$95 - $210
Lux GEO	Use with or without WiFi, 7-day programming, air filter monitor, and large backlit display.	$95 - $160
Nest Thermostat	Adjusts temperature based on personal habits, large, clear display; efficient temperature control; connects to Amazon Alexa for voice control.	$205 - $250
Sensi Touch Wi-Fi Thermostat	Smart alerts, automatic upgrades, color shift, back glow, humidity readings, brightness adjust, easy do-it-yourself installation, and a seamless smart home integration	$145 - $170
Bosch Connected Control	Weather access, 5" full-color touch screen, compatible with most HVAC systems, programmable.	$160 - $170

Smart Air Quality Sensors/Smart Air Purifiers

Name	Features	Price Range
Awair Air Quality Monitor	Monitors home air composition by tracking toxins, dust, and chemicals. Connects to home technologies such as Nest, Alexa, smartphones, and tablets to provide information feedback.	$160 - $170
Flowie Waterflow Sensor	Connects to water meter to detect water use as well as air quality and humidity.	$390 - $400
Foobot Air Quality Monitor	Sends data to a smartphone or tablet about home air quality. Uses colored LED lights to show the user what the air temperature, humidity, and purity is like. Connects with other Smart Home Technologies such as Nest and Amazon Echo.	$195 - $205
Levoit Air Purifier and Sensor	Levoit purifies the air by ridding home air of toxins, dust, and other particles. The device provides smart feedback by suggesting specific use of fan speed to keep air cleaner. The device has a sleep mode to adjust the purifier to the needs of the user at night.	$85 - $160
Wynd Wearable Air Quality Tracker	This wearable and portable technology connects to a mobile app on smartphone or tablet to monitor air quality anywhere you go. Through the app, it provides information on the level of particles in the environment such as allergens and fuels.	$75 - $80

Smart Appliances

Name	Features	Price Range
Behmor Smart Coffee Maker	Remote control of your coffee maker via smartphone or device. Connects with Amazon Alexa and Amazon Dash.	$165 - $175
Kenmore Smart Dryer	Remote control of your dryer via smartphone or device.	$985 - $1,150
LG InstaView Door in Door	Voice activation through Google Assistant, gives notifications of open door for energy efficiency.	$1,895 - $2,695
Samsung Flex Duo Smart Oven	Control and monitor cooking activities through Wi- Fi connectivity.	$2,195 - $2,395
Samsung High Efficiency front-load washer	Remote control of your washer through Wi-Fi connectivity.	$995 - $1,045

Smart Hubs

Name	Features	Price Range
Iris Smart Hub	This Smart Hub is the heart of the Iris Network and allows control of your connected technologies using the Iris app.	$65 - $75
Logitech Harmony Hub	The Logitech Harmony Hub connects with over 270,000 entertainment and smart home technologies. You will have the ability to control the Harmony Hub by using your smartphone or tablet.	$70 - $100
Phillips Hue Bridge (2nd Generation)	Control lighting, adjust thermostat, or lock doors via voice commands.	$50 - $60
Samsung SmartThings Hub	Connects a variety of Smart Home Technologies, compatible on App, connects with Echo, learns household behaviors by monitoring technologies at all times.	$80 - $90
Wink Connected Home Hub	Connects multiple Smart Home Technologies, sets patterns and connects technologies in the house; allows for easy control via Wink App.	$25 - $35

Smart Home Assistants

Name	Features	Price Range
Amazon Echo	Responds to voice commands to control other home technologies and complete tasks such as report the weather, play music, and create calendar events.	$45 - $230
Apple Home Pod	Plays music by adapting to the speaker's and user's environment. Also acts as a home assistant through the voice detecting use of Siri to answer questions and complete tasks.	$295 - $350
Google Home Assistant	Responds to voice commands to control other home technologies and complete tasks such as report the weather, play music, and create calendar events.	$45 - $130
Insignia Voice	Voice activation plays songs for the user. Pairs to other technologies through Wi-Fi and Bluetooth. The device has a built-in Google Assistant to answer questions and access the Internet.	$45 - $55
Ultimate Ears	Voice activation plays songs for the user. The device has a built-in Amazon Alexa to answer questions and complete tasks with Wi-Fi connectivity.	$190 - $250

Smart In-Home Displays

Name	Features	Price Range
Cevia's Homeview	This Wi-Fi connected 8-inch display allows for instant home energy updates. Receive not only photos from anywhere in the world, but also alerts and messages from your utility. Homeview can monitor and control a wide variety of Smart Technology.	$140 - $160
CURB Home Energy Monitoring System	Home energy monitoring system that attaches to a breaker panel to show individual appliance energy consumption. Communicates to the resident through iOS or android technologies to give updates on usage and projected costs.	$395 - $405
Neurio	Home energy monitoring system that provides cost updates and notifications to a smartphone or device to better understand home energy usage and areas for savings.	$215 - $225
TED Pro Home Electricity Monitor	Monitors electricity usage in the home and communicates with resident and utility company on high areas of usage and ways to cut monthly bills. Compatible with smartphones and Alexa.	$295 - $500
Sense Home Smart Meter	Device that installs into home electrical panel that monitors power usage. Sends notifications to a smartphone or device about usage monitoring and changes. The device learns patterns in energy use to maximize efficiency while lowering cost.	$295 - $350
Smappee	Smappee is an appliance-focused meter that monitors energy usage from technologies such as a heat pump or electric car. Via smart phone or device, Smappee provides the user with information on energy usage per individual technologies and factors. It provides alerts if there are leaks or errors in energy usage to create cost savings.	$245 - $350

Appendix C: Frequently Asked Questions

What is the Internet of Things?
The Internet of Things **(IoT)** is a broad term that refers to everyday devices like lights, thermostats, and locks that can connect to the Internet and to each other. These connected devices can exchange data and work together, automating tasks that used to be manually performed. By 2020, it is predicted that there will be anywhere between 26 billion to 200 billion devices connected to the Internet.

What Is a smart home?
A smart home is more than a collection of smart devices, and it's more than a "connected" home. One could live in a house with many smart devices that are connected to the Internet, but that wouldn't make the home a smart home. If those devices are connected to each other and working together to automate several the home's processes, we're closer to a definition of smart home most people can agree with.

What are smart devices, and how much do they cost?
The lights, thermostats, and more that comprise the Internet of Things are called smart devices. A by-no-means complete list of smart devices includes:

- **Thermostats** – allow you to control your home's temperature remotely and see your usage for heating and cooling. Price range: approximately $200-$250.

- **Locks** – allow you to control who has access to your home and see when they access your home, even if you're not on site. Price range: most sell for approximately $200.

- **Lights** – can be adjusted from your smart phone for comfort and brightness and can be set on a schedule. Price range: wide; anywhere from $50 to $200.

- **Plugs** – allow you to control "dumb" objects, as well as monitor energy consumption of anything plugged into them. Price range: most are about $50.

- **Cameras** – can alert you to intruders, record video, and set off a siren. Price range: between $100 and $200.

- **Smoke and CO Alarms** - will alert you (on your command device) to increased levels of carbon monoxide or the presence of smoke. Price range: about $100.

What is a smart hub?
A smart hub is a central device that allows all the different products (lights, locks, thermostats and more) to work together in a smart home. You need not have a hub in a home to use smart devices, but you need one if you want to truly automate the behavior of the various smart devices in your home.

What are the benefits of smart hubs?
Smart hubs simplify the setup and use of multiple smart devices, creating a unified experience throughout your home. A hub not only places all your devices within one app, it can chain together events that keep the residents of your home happier, healthier, and safer. For instance, you can have your hub turn on the AC and certain lights when you're at home and turn them off – and turn on other lights – when you're away.

How do smart hubs work?
Smart hubs work by incorporating several device protocols – such as Bluetooth, Wi-Fi, Zigbee, and others into one product, so that these devices that usually cannot talk to each other have a place to communicate. From there, consumers can use one app, instead of many, to control multiple devices at once, without being constrained to one brand or protocol. Smart hubs are an extra investment outside of the devices themselves and are not required for most products. However, they are inexpensive and often simplify the smart home experience.

What are the benefits of a smart home?
The top benefits of a smart home are convenience, energy efficiency, and security. According to a 2015 survey conducted by Coldwell Banker and CNET:

- 57% of smart device owners say their devices save them time;
- 45% of smart device owners report their devices save them money; and
- 72% of smart device owners state their devices make them feel safer.

Many consumers install smart devices to be able to control their lighting with their voice, or to adjust the temperature level of their home from an app on their smartphone. Some consumers install devices that will open their garage door automatically as they pull onto their street or unlock their front door as they approach their house.

The goal is to make to make common household tasks more streamlined or automated. Other consumers enjoy the energy savings of being able to automatically disable the costly heating and cooling of their homes when they are away. There is even an entire smart home device category for home energy monitors, which can show real-time energy usage.

Knowing your home's energy profile can help you identify ways to save money. Motion detectors, smoke and CO detectors, and security cameras can work in concert to alert homeowners that something is amiss in their home. From there, you have the option to alert safety officials in your area. This technology exists today and is continuing to be improved all the time.

What are the financial benefits of using smart home technology?

- **Devices**: Smart thermostats can easily pay for themselves over time. In a 2015 white paper, Nest claims that use of their smart thermostat results in average savings up to 10-12 percent on heating bills and 15 percent on cooling bills. Other manufacturers claim similar benefits.

- **Insurance**: Many insurance companies offer reduced rates for homes that have smart locks, smoke alarms, and security cameras. We've seen discounts of up to 15 percent.

- **Rebates**: Gas and electric companies often pay rebates to users of smart thermostats. These rebates can exceed $100 and will cover almost half the price of a new smart thermostat.

Who owns the data, and how is smart home device data used?
The type of data collected will vary by device. For security devices, they may be collecting real-time video feeds; for door locks, it may be who arrives and when.

- **Who owns the data?** In general, you, the consumer will own the data. However, each vendor can vary, so it is up to the consumer to make sure they have ownership of their data.

- **How is smart device data used?** The data collected by vendors can be used in a multitude of ways, from simple analytics to advanced algorithm improvements. These results are generally used by smart device companies to improve product development and provide additional services to their customers. You should also read the vendor's privacy policy to see what they are legally allowed to do with the data. They may allow themselves to sell your data to third parties, so read carefully.

What are the connectivity options for a smart home?
There are many options when it comes to device connectivity, but they can generally be put into three different categories:

- **Wi-Fi**. These devices connect directly to your router or gateway and have direct access to the Internet. This makes it easy to control the device from anywhere in the world. Some drawbacks are limited battery life and a greater risk of attack from hackers.

- **Bluetooth**. These devices will talk directly to your phone and this makes them ideal for creating secure personal network. With the release of Bluetooth Low Energy (BLE), these devices can provide weeks and months of connectivity on a single battery charge. To connect these devices to the Internet for control or monitoring, it will require your phone to act as a gateway or a dedicated hub connected to the Internet.

- **IEEE 802.15.4 (Zigbee)**. This is a low energy, mesh networking protocol specifically built for device-to-device infrastructures. This protocol is the basis for Zigbee, Thread, and others. It is extremely low energy and can provide months and years of operation on battery. Generally, the only way to talk to these devices over the Internet is to use a hub.

Can I Install Smart Home Devices Myself?
As with any other home improvement project, some smart home projects are quick and easy, while some are time-consuming and more difficult. In almost all cases, there are physical tasks (e.g., removing dead bolts and thermostats and replacing them with their smart equivalents), as well as information technology and connection tasks (e.g., getting devices to "talk" to each other, setting up schedules).

What are some of the challenges of a smart home?
Today's smart home is not without its complications. Just like any emerging technology, smart home products are going through their fair share of growing pains. These problems range from occasional downtime to exposing your home network to cyber criminals. Since these new products directly affect the safety and security of your home, the bar needs to be set much higher. Current low-tech solutions (e.g., smoke alarm, light switches, deadbolts, thermostat) in the home are already near 100% reliable.

To be successful, new smart home products need that level of reliability and convenience. The heavy reliance on cloud computing means these devices may only be as dependable as your home internet connection. Lastly, there is heavy competition between large corporations for control of the smart home retail space, leading to a fragmentation of the market. This leads to consumers needing separate apps to control their lights, locks, or thermostats.

Are there security risks associated with smart home devices?
Issues with security and privacy are to be considered as with anything connected to the Internet. As with any account you have, the first line of defense is a strong and constantly changed password.

Do smart devices affect the selling price of a home?
Because smart home technology is relatively new, its effect on home prices is just beginning to be evaluated. What we *do* know, according to a 2016 Coldwell Banker smart home survey, is that homeowners are willing to invest significantly in smart home technology. Seventy-two percent of millennial homeowners say they would spend $1,500 or more to make their home smart; 44 percent say they would pay $3,000 or more to do so. Who might be willing to pay more for a home with smart technology? For parents with children, 59 percent told Coldwell Banker they would pay more for a smart home.

What happens to a smart home & smart device when the power goes out?
Many but not all smart devices will stop working, just like the devices, appliances and systems in any other home during a power outage. However, a number of these devices operate on batteries, like smart door locks, allowing them to continue to function, although any remote-controlled features enabled by the Internet won't work until the power is restored. Batteries in smart thermostats will also maintain the memory of programmed schedules of operation so the user doesn't need to be concerned about re-programming when the power is restored. Similarly, batteries backing up some camera systems will continue to operate locally, although Internet-enabled remote monitoring won't be available. All things considered, a smart home is no worse off than a "dumb" or non-connected home during a power outage and may be slightly better off.

Appendix D: Glossary of Terms

Sources: The terms contained in this glossary combine those found in glossaries complied by: CRT Labs at The National Association of Realtors (https://crtlabs.org/smart-homeglossary/); the Home Automation Glossary (https://www.vesternet.com/resources/glossary); and Smart Grid Today: (https://www.smartgridtoday.com/public/Glossary2.cfm).

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To view the full glossary on Smart Grid Today's website, please visit:
https://www.smartgridtoday.com/public/glossary.cfm.

Actuator: A device that is triggered by a sensor.

AirPlay: The wireless protocol used by Apple to allow for audio and video streaming over a wireless network between compatible technologies.

Application (APP, app): A term used to describe an application that runs on mobile technologies such as personal smartphones and tablet computers.

Automated or Advanced Metering Infrastructure (AMI): A utility infrastructure with two-way communications for metering and associated systems allowing delivery of a wide variety of services and applications to the utility and customer.

Applet: The IFTTT Applet triggers an action or response using the IFTTT web service whenever an event occurred. (If this happens, do that) or (If this happens, do this, and then this, and then this).

Automation: The ability for your home or technologies to react without input from humans. For most smart homes, this is achieved by having multiple technologies communicate with each other, including sensors, cameras, and other products, to achieve varying levels of automation.

Bluetooth LE/ Bluetooth Smart: A wireless protocol that is popular among smart home technologies.

Cloud-to-Cloud: Many smart home products use cloud services for their core functionality. Although it is not ideal having your technologies relying on an Internet connection, it does sometimes allow for increased interoperability. Two technologies in the same room might not be able to communicate directly. Instead, messages are sent back and forth through their respective cloud services over the Internet. This is known as "cloud to cloud" and is becoming a popular way for hardware vendors to increase compatibility.

coMesh Network: Protocols that are designed using a mesh network means products can pass messages from device to device in a "hopping" fashion until the final destination is reached. Every device in your home acts as a range extender; the more technologies you have, the more powerful/ reliable your network becomes.

Device: A specific electronic product that can be controlled through the wireless network. The device can be a local wireless controller, which controls a specific light or appliance (usually connected to it by mains wiring), or a sensor that provides input to the network. Each device is seen as a network Node.

Digital Home Assistants: Digital applications that use voice recognition to aid in the control of a smart home. Amazon's Alexa, the Google Assistant, and Siri are all examples of voice assistants that are designed to control smart home technologies.

Dimmer: A wireless controlled device that controls the brightness, as well as the On/Off state of a local light.

Ethernet: Common network system using cables (wired network). This system is less common in homes, where the more convenient Wi-Fi (wireless) system is used. However, the wireless Router typically includes Ethernet sockets so that a PC or other device can be directly connected to it.

Event: A set of commands that is instigated following a trigger from a device or sensor. For instance, when a motion detector is tripped a light comes on.

Gateway: Connects home automation network to the Internet. The Gateway enables you to control the network and all the technologies on it from anywhere in the world using a computer or smartphone. It also enables your network to send and retrieve information from specific remotely located servers.

Geofence: A virtual perimeter for the real world. Using your Wi-Fi, Bluetooth, or GPS radios, your Smart Home software can trigger events based on your physical location. For example, you can use a geofence to automatically turn off your lights when you leave for the day.

Groups: A collection of individual technologies, which can be controlled as a group. For instance, a controller can switch them all on with one action, rather than having to turn on each device individually.

Home Automation: All aspects of adding control to your home and appliances. It can be as simple as adding remote control to a few lights or creating a more complex system that includes automatic sensors and security systems.

Hub: The central device that allows all the different products (lights, locks, thermostats) to work together. Most hubs will also act like a universal remote, as well as providing the tools necessary to automate your technologies.

IFTTT: "If This, Then That" allows users to connect multiple technologies by creating "recipes" for products that may not natively speak to each other. For instance, you can have your lights flash on and off when you need to leave work at 5 p.m. if you find yourself often late to dinner.

Interoperability: The ability for different smart home technologies and services to reliably work together.

IoT (Internet of Things): A broad term that refers to everyday technologies such as lights, thermostats, and locks that can connect to the Internet and to each other. These connected technologies can exchange data and work together, automating tasks that used to be manually performed.

Internet Protocol IP: A device that can send information using a computer network or the Internet. It is commonly used with security cameras.

Load: An electrical load is an electrical component or portion of a circuit that consumes electric power such as appliances and lights.

Network: Two or more connected technologies. This enables the technologies to be controlled and to communicate with each other. The reason for home automation it is typically referred to a Wireless Network as a Network.

Pairing: The process to add a device to a wireless network. When paired, the device can be controlled by the network.

Portable Controller: A network controller that can be moved around the home. These controllers are normally hand-held, and battery powered.

Protocol: The language that technologies use to send commands to one another. Examples of popular smart home protocols include X10, Bluetooth Low Energy, Z-wave, and ZigBee.

Router: Connects a local area network (LAN) to the Internet.

Sensor: Offers a wide variety of information that can tell you not only about things going on in your home, but also be used for home automation. Presence sensors can detect if people are in a certain area, detect motion indoors and outdoors, gather indoor environmental quality factors, and report this information to other technologies using IFTTT, a smart home hub, or other protocols to make devices like lights, fans, and heating, ventilation and air condition (HVAC) units run.

Setpoint Temperature: The temperature that the thermostat is set to. If the room's temperature is below the setpoint temperature, the thermostat will send a signal (or close a switch) to turn on the heating system.

Smart Assistant: The virtual person that “lives” in a hub to assist you such as Amazon’s Alexa or Apple’s Siri.

Smart Grid: A nickname for the utility power distribution grid enabled with computer technology and two-way digital communications networking.

Smart Locks: Technologies that connect to your existing door or dead bolt locking system and are operated via a wireless signal and controllable through an interface on a smartphone, watch or tablet.

Smart Meter: A utility meter for electricity, natural gas or water, usually, that always includes two-way communications technology (see AMI).

Smart Outlets (also called ‘Smart Plugs’): An adaptor that is used for ‘non-smart’ technologies that allows them to be remotely controlled (either by voice or app).

Virtual Private Network (VPN): A method of keeping the presence of and network technologies belonging to users secure and hidden from other users on the same network infrastructure.

Wi-Fi: A local area network that uses high frequency radio signals to transmit and receive data over distances of a few hundred feet.

X10: One of the oldest protocols still used in home and building automation. Developed in the in the 1970s, it uses the power lines in your home to allow communication between technologies. This simple system is very reliable, but not as capable as modern protocols.

Z-Wave: A wireless communications protocol designed for home automation. It is mainly used in the residential space to provide a simple yet reliable way to wirelessly control lighting, locks, HVAC, and window treatments.

ZigBee: A low-cost, low-power, wireless mesh network designed to be used with technologies or sensors that had very low power consumption and did not need to send large amounts of data

Appendix E: Additional Resources

American Association of Persons with Disabilities – https://www.aapd.com/

American Council for the Blind – https://www.acb.org/

Association of Programs for Rural Independent Living – www.april-rural.org

Association on Higher Education and Disability – www.ahead.org

Christopher & Dana Reeve Foundation – https://www.christopherreeve.org/

Disabled People's International – www.dpi.org

Easterseals – www.easterseals.com

Hearing Loss Association of America – https://www.hearingloss.org/

Illinois Assistive Technology Programs (IATP) – https://www.iltech.org/

Illinois Networks of Centers for Independent Living (INCIL) – https://www.incil.org/

Independent Living Research Utilization – www.ilru.org

National Association of the Deaf – www.nad.org

National Council on Independent Living – www.ncil.org

National Federation for the Blind – www.nfb.org

National Multiple Sclerosis Society – www.nationalmssociety.org

National Organization on Disability – www.nod.org

National Council on Disability – www.ncd.gov

Rehabilitation International – www.riglobal.net

Self-Advocates Becoming Empowered (SABE) – https://www.sabeusa.org/

Self-Advocacy Resource and Technical Assistance Center – https://selfadvocacyinfo.org/

Society for Disability Studies – www.disstudies.org

The Arc – https://thearc.org/

United States International Council on Disabilities – www.usicd.org

Caregiving Resources

(Adapted from the "Paralysis Resource Guide" Christopher & Dana Reeve Foundation)

Caregiver Action Network – www.caregiveraction.org

National Alliance for Caregiving – www.caregiving.org

Rosalynn Carter Institute for Caregiving – www.rosalynncarter.org

Well Spouse Association – www.wellspouse.org

The Family Caregiver Alliance – www.caregiver.org

AARP – www.aarp.org/home-family/cargiving

Caregiver Media Group – www.caregiver.com

National Respite Coalition Network – www.archrespite.org

National Caregivers Library – www.caregiverslibrary.org

Shepherd's Centers of America – www.sheperdscenters.org

CareCure Forum – www.sci.rutgers.edu