

A Designer's Guide to Common Tech Words and Phrases

01 ABOUT THIS DOCUMENT

INTRODUCTION: DOCUMENT SCOPE

This document has been created by CEDIA (the Custom Electronic Design and Installation Association) to enable Design Professionals to better understand the terminology used in the Home Technology Industry.

CEDIA, the industry trade association, represents 3,500 member companies worldwide and serves more than 22,000 industry professionals that specialise in the design and installation of integrated systems to reflect the technology needs of the homeowner. The systems our members specialise in integrating include home cinema; lighting control; AV; networking; energy monitoring; HVAC and security.

For more information about CEDIA or additional resources, please visit www.cedia.org.

CEDIA also has a BIID & RIBA accredited CPD presentation 'Designing Integrated Future-Ready Homes' which is available to Design Professionals internationally. Our CEDIA Certified Outreach Instructors are able to deliver the presentation at your practice or alternatively we present the CPD and a number of events across the UK. To arrange a member to present the CPD at your practice, please contact CEDIA, +44 (0)1480 213744 or email cpd@cedia.co.uk.

NB: This document should be used as general guidance only. Some of the terms have been simplified from extremely technical terms. If you would like to discuss any terms further please contact a CEDIA member using the Finder Service on www.cedia.org.

02 GLOSSARY OF TERMS

Accent lighting

Lighting that adds interest to a room or landscape by drawing attention to an object or architectural detail.

Acoustic Treatment /Absorber

Anything that absorbs sound and thus reduces sound reflections in a room; can be a device intended for this purpose or ordinary objects and people in the room.

Acoustically transparent (AT) screen

Video projection screen made with fabric mesh or vinyl with small perforations to allow sound to pass through.

Active Loudspeaker

A loudspeaker which has the amplifier(s) built in. In home cinema this is usually a subwoofer.

Ambient Lighting

Overall illumination in a room or space. May include both natural light and artificial light.

Aspect Ratio

Relationship of screen width to screen height in a video screen e.g 16:9 which is digital TV standard.

Attenuation

Decrease in the value of the power of a signal or sound. Commonly measured in decibels (dB).

Audio Calibration

The process of evaluating; verifying, and tuning an audio system to optimise performance according to established sound quality goals.

Audio Power Amplifier

An audio component that receives a line level (low level) signal and increases its amplitude to drive loudspeakers.

Audio/Video Receiver (AVR)

A component which selects sources, processes audio and video, tunes radio stations, and provides amplified output to drive speakers.

AV Installation

The installation of the components of the final system. There are a number of phases as follows:
- 1. First fix – when the infrastructure cables are

installed before ceilings and walls are closed up.

- 2. 2nd fix – where the passive components such as Speakers and cable termination are installed ;
commissioning – when the active equipment TVs, Amplifiers etc are installed and programmed.

- 3. Sign-off – when the system is deemed complete and functioning as expected, the users have received their training and completion payments are agreed with client and contractor.

Bluetooth

Wireless radio data transfer specification working on the 2.4Ghz band that allows for PAN (Personal Area Network) communication between devices.

Blu-ray Disc

Recording format that has the ability to store several hours of high definition video signals on a disc the same size and shape as a conventional DVD.

Broadband

High-speed data (typically an Internet connection) to the home via the telephone line, fibre, CATV, mobile phone network or a combination of satellite dish.

Cable

Two or more wires inside a common jacket, designed for a specific application.

Cable Modem

Device provided by cable television service companies to connect their cable network to an Ethernet network.

Cable Schedule

Document showing every cable run in a project, including its start point; destination; cable type; use; and termination type. Should also have a provision to check off or initial when each cable is run, terminated, and tested CAD — see Computer aided design.

Cable TV (CATV)

Television, phone and data services delivered to the home together using an underground cable rather than an aerial or satellite dish and separate from the usual telephone line. Typically uses a coax or fibre-optic cable.

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Cabling

- Category 5 Enhanced (Cat5e)

A data cable consisting of 4 twisted pair conductors used for home networks but can also be deployed for telephone and other low voltage communications.

- Category 6 Augmented (Cat6a)

As “Cat5e” but with additional physical spacing internally and thicker wire cores to allow faster data speed and / or longer cable lengths to be used.

- Fibre-optic

A type of cable which uses light, rather than electricity, to pass data from one end to the other. Often made from a glass core surrounded by a protective covering, cheaper variants use a plastic material. Used for very high-speed data.

- Multi-Mode Optical Fibre

Optical fibre whose core diameter is large relative to the wavelength (see wavelength) of the light, thus allowing a large number of modes to propagate.

- Siamese (“Shotgun”) Cable

A combined cable construction where two independent cables are laid side-by-side and then moulded together during manufacturing. Although electrically separate their combined form is designed to reduce time when running multiple cables around the home.

- Single Mode Optical Fibre (SMF)

Type of optical fibre designed to carry only a single ray of light (mode).

- Shielded Twisted Pair (STP)

Twisted pair cable, usually 8 conductor, which includes a foil shield to protect from EMI and RFI.

- Twisted Pair

Two insulated copper wires twisted around each other to reduce induction (therefore interference); common type of transmission media.

- Unshielded Twisted Pair (UTP)

Commonly used cable in the electronic systems industry used for telephone and networking. Usually 8 conductor, no shield. Includes unshielded CAT5e and CAT6.

- Coaxial Cable

A two-core cable comprising a central conductor surrounded by an insulator and “wrap around” braid which acts as shield and ground return and an overall insulating outer sheath. Used for radio frequency signals such as television, radio, satellite and CCTV or analogue audio and video. Various types and specifications are available dependant on intended use.

CEDIA

The Custom Electronic Design and Installation Association (CEDIA) is the international trade organisation for the home electronic systems industry. CEDIA members specialise in the planning, design, supply and installation of automated electronic systems for the modern, intelligent home.

CEDIA Certified

CEDIA Certification establishes clear, objective standards for knowledge in residential electronic systems design and installation. Certification was introduced in 2003 to meet the growing need for quality standards within the industry.

Closed Circuit Television (CCTV)

Security cameras and connected monitors and recorders typically used for security purposes.

Crosstalk

The amount of a signal in one wire or circuit that is unintentionally induced into an adjacent wire or circuit carrying a different signal.

CEC

Specific feature on HDMI-enabled equipment that allows communication between HDMI-connected devices via simple commands (like “play”) that control other devices without any special programming.

Central Processing Unit (CPU)

The “Brain” of a computer that executes all calculations and machine instructions.

Computer aided design (CAD)

When a piece of software running on a computer is used to create drawings and schematics that represent the system that is going to be installed.

Digital Audio Broadcasting or Digital Radio (DAB)

Modern replacement for “FM” radio using digital transmission. Popular in the UK and some parts of Europe.

Display

OLED

• Short for organic light-emitting diode, a display device that sandwiches carbon-based films between two charged electrodes, normally in glass.

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- OLED displays are emissive devices - they emit light rather than modulate transmitted or reflected light.
- OLED is beginning to replace LCD technology in handheld devices such as PDAs and cellular phones because the technology is brighter, thinner, faster and lighter than LCDs, uses less power, offers higher contrast and is cheaper to manufacture.

Plasma or PDP (Plasma Display Panel)

- A type of flat panel technology common to large TV displays. The screen technology utilises small cells containing electrically charged ionised gases or plasma cells to make up the pixels in the screen, and varies the voltage to generate the different colours from the gas. Use more electrical power, on average, than an LCD TV.

LED TV

- LED TV is a type of LCD television that uses light-emitting diodes (LEDs) to backlight the display. An LED is a semiconductor device that emits visible light when an electric current passes through it. LED TVs have significantly lower power requirements and convert power to light more efficiently. An LED also lasts much longer than most other lighting technologies.

- The most commonly used LED technology is edge-lit LED, in which white LEDs are situated around the edge of the screen and a diffusion panel employed to illuminate the display evenly. Edge-lit LED displays can be very thin.

CRT (Cathode Ray Tube)

- CRT is the technology used in traditional computer monitors and televisions. The image on a CRT display is created by firing electrons from the back of the tube to phosphors located towards the front screen.

- Once the electrons hit the phosphors, they light up and are projected on the screen. The color on the screen is produced by a blend of red, blue, and green light, often referred to as RGB.

- This technology is being replaced rapidly with LCD and LED technologies.

Ethernet

Network data communication using wired or wireless connections. Deploys the IEEE802 standards and is used for distributing Internet access, media and other communications around a home.

Ethernet Switch

An Ethernet switch is a networking device that connects networked devices together.

Extra Low Voltage (ELV)

Official terminology for electrical supplies of less than 50 V AC or 120 V DC.

Frequency Modulation (FM)

An electrical method of using a high frequency "carrier" to move lower frequency content. Used as a generalized term to describe VHF analogue radio services in the frequency range of 88MHz to 108MHz.

Firewall

Security measures (hardware and/or software) that blocks unauthorised users from gaining access to a computer or network.

Frame Rate

The number of video images captured or displayed each second.

Future-proof

As we do not know what the future holds with regard to technology, it is recommended that a cabling infrastructure is installed in order to make the property "Future-Ready".

Gateway (AKA Router)

A piece of hardware which connects one network to another. Most commonly this will be the link from a home network to the Internet.

Giga Bit Ethernet (GBE)

The fastest form of Ethernet network currently in use within homes. Offers a maximum data speed of 1Gb/s.

Glass Break Detector

A sensor that responds to the shattering of a pane of glass. They may be either audio sensitive or mechanical.

Graphical User Interface (GUI)

Tools or software that allow people to interact with a machine, device, computer program, or other complex tool. ie touchscreen design.

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Hardwired System

A system using wires to communicate rather than through the air (or wireless).

Head End

Hub

Central enclosure and connectivity for likes of telecoms, computer networking and aerial distribution for small to medium properties.

Patch Panel

Centrally located connection ports typically for Cat5/6 cabling or Fibre optics. Patch panels or bays make it easier to connect different devices in different orders for different configurations, due to the flexibility of all cabling being terminated into the fixed panel. Typically in a 19" format as standard Patch panel design for large residential dwellings. Patch panels can be used for connection to switchers and routers for computer networking and Audio and video distribution.

AV Rack

A 19-inch rack is a standardised frame or enclosure for mounting multiple equipment modules. The 19" rack can house the main control systems in a property including the lighting, audio, video and networking devices to manage a home installation. Each module has a front panel that is 19 inches (482.6 mm) wide, with standardised modules that can be fastened to the rack frame with screws.

- Audio Video Head End (AVHE)

A dedicated central location within the home where audio and video equipment is located alongside cable termination points connected to remote rooms.

- Extra Low Voltage Head End (ELVHE)

A dedicated central location within the home where network, data and other small signal communication equipment is located alongside cable termination points connected to remote rooms.

High Definition Digital Television (HDTV)

Digital television format that provides a high-quality widescreen picture (16:9) with digital surround sound.

High-Definition Multimedia Interface (HDMI)

A compact audio/video interface used to transmit uncompressed digital streams, digital surround sound, control and network information and two channels of audio return signal.

Home Automation

The electronic connection and control of electrical and mechanical devices by a wider, unified control system, e.g. curtains, blinds, lighting, audio / video systems, HVAC, telecoms, internet etc.

HVAC

Heating; Ventilation & Air-conditioning.

Infrastructure (cabling)

Part of a network infrastructure that connects devices. Normally has a higher bandwidth than the individual segments connected to it.

Integrated System

Several sub-systems connected so that they work together and can be controlled easily.

Internet Protocol Address (IP Address)

Unique number that each device on a computer network uses for identification.

Internet Service Provider (ISP)

Company that provides connectivity to the Internet.

Lighting Control System (Centralised)

Type of lighting system where control comes from one central source rather than many individual switches.

Load Schedule

Part of a lighting plan that details the electricity usage of the elements in the electrical plan; includes load identification, floor and room, load type, number and type of fixtures and the power consumed by each.

Local Area Network (LAN)

Computer network covering a local area, such as a home, office or small group of buildings.

Low Voltage

Official terminology for any electrical supply higher than those defined by "Extra Low Voltage" but less than 1000 V AC or 1500 V DC. This includes mains electricity.

LVHE

Low Voltage Head End - see Head End.

Keypad

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A set of buttons arranged in a block with numbers, letters and or icons used for the control over telephony, security or audio/video systems, lighting and subsystems.

KNX (aka Instabus or IEE)

KNX is a standardised (EN 50090, ISO/IEC 14543), network communications protocol for intelligent buildings. Previously known as European Home Systems Protocol (EHS), BâtiBUS, and the European Installation Bus (EIB or Instabus), The KNX standard is administered by the KNX Association. Through connected, intercompatible devices, KNX can manage and distribute Lighting control, Heating/ventilation & Air Conditioning control, Shutter/Blind & shading control, Alarm monitoring, Energy management & Electricity/Gas/Water metering & Audio & video distribution. With several thousand approved devices of different manufacturers and different applications can be combined to a working installation.

Monitoring Service

Company that offers contracted services to receive information from security systems and pass on information to the appropriate people or authorities. Also known as Central Station.

Motion Detectors (also see PIR)

A variety of technologies to sense movement for lighting and security.

Multi-room Audio/Multi-zone Audio

An audio system allowing music to be played in multiple rooms, each room having access to different sources and at different volume levels if required.

Multi-Source Audio

Audio system which allows the user to choose between different audio sources.

PIR

Passive Infrared Sensor - See Motion Detector.

Plenum/Ceiling Void

The cavity above a drop ceiling which is used as a air return to the air handler, primarily in commercial construction. Cabling in this space is usually required to be plenum rated.

Primary Listening Position/Sweet Spot

The location in a home theatre which the system is calibrated to for optimal performance.

Programmable Thermostat

Thermostat with the ability to record different temperature/time settings for heating and/or cooling equipment and thus control the equipment by those settings.

Programming

The overall concept of designing; writing; testing; debugging and documenting home technology systems.

Progressive Scanning (p)

Television format in which information to each pixel in a frame of video sequentially, from left to right and top to bottom to create an image eg 1080p; 720p.

Pull Tension

The amount of tension put on a cable as it is being installed or while suspended between two points. The maximum recommended pull tension is the amount (in lbs. or kg) beyond which performance may be compromised.

Resolution

Digital video - the number of pixels present in a device used to produce images. Currently the most common and now fairly standard resolution for digital TV displays will be 1080 x 1920 pixels which is just over 2 million pixels (2MP).

Audio- resolution in digital music will be a combination of the Bit depth and sampling frequency. Eg A CD is 44.1khz 16bit. Today higher resolutions of 24 bit and sampling frequencies ranging from 96khz up to 192khz are more common, which are the same as used in recording studios.

Retrofit

To install something into an existing structure.

RJ-11

The RJ11 (6P2C) connector is the smaller brother to the RJ45. It is most commonly found as the connector for the incoming telephone line to a phone, modem, fax etc and will use 2 of the 6 pins.

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RJ-45

Standard 8 position/8 contact (8P8C) type of connector used for data and telephone. May be male (plug) or female (jack).

Satellite TV (Digital Broadcast Satellite - DBS)

System that sends TV broadcasts directly from a communications satellite to home antennas, or dishes.

Schematic Diagram

Detailed diagram for the purpose of understanding the interconnection of devices and to provide graphical information for the assembly or service of a system.

Scope of Work Document

Agreement document among the project team and key stakeholders. It represents a common understanding of the project and sets authorities and limits for the project manager and team. It includes business objectives and the boundaries of the project including approach, deliverables, milestones, and budget.

Security Panel

The central processor of the security system.

Server

Computer or device on a network that manages a network's resources or to store media content.

Service Set Identification (SSID)

A 32-character alphanumeric key uniquely identifying a wireless LAN.

Setpoint

Defined indicator point in an HVAC system where a specific action takes place (turn on/off, etc).

Shield

A part of many cable types which reduces signal loss of high frequencies and external interference such as RFI and EMI. Sometimes also provides an electrical return path.

Smartphone

A mobile phone that is able to perform many of the functions of a computer, typically having a relatively large screen and an operating system capable of running general-purpose applications.

Static IP

A static IP address is an Internet Protocol address assigned to a particular device. This communicates with the router for making it easier for installers to better manage installations such as remote monitoring, CCTV integration & locating a server in the building. A static IP address is a fixed, permanent address that is unique to a device and does not change in contrast to a dynamic IP address, which is one that changes every time you connect to the internet.

Structured Programming

Programming methodology that utilises a set of well-defined structures, such as condition statements and loops to produce code that is more easily understood and maintained.

Subwoofer (active or passive)

A loudspeaker designed to reproduce the lowest audible frequencies. Are often powered (active).

Systems Designer

Industry professional who specifies the components and configuration of integrated electronic systems.

Systems Installer/Systems Integrator

Systems installer: A company or individual who designs and installs various electronic systems. An integrator will do this but also link them together so that they can be controlled easily from one user interface.

Tablet

A mobile computer with display, circuitry and battery in a single unit.

Termination

Process of installing a connector or connection on a cable or wire to make it useable for the intended use. Examples; F Connector on RG6, RJ-45 or punch block on Cat5e.

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Thermostat

Control unit that turns on the heating or cooling system based upon its reading from a temperature sensor.

Throw Distance

The distance the projector is from the screen.

Touchscreen

Device used to allow control via simply touching a graphical display through a resistive or capacitive screen.

Transmission Control Protocol/Internet Protocol (TCP/IP)

Set of protocols that allow communication between computers; used as the standard for transmitting data over networks and as the basis for standard Internet protocols.

Ventilation

The process of “changing” or replacing air in any space to control temperature, or remove moisture. Particularly important in the main communications room of a property, ventilation increases the energy needed for heating or cooling. Generally employed in 19” AV rack for cooling main devices feeding the property with likes of whole house Audio, Video Lighting etc.

Wide Area Network (WAN)

A network connecting computers over a very large geographical area such as states, countries, and the world. The Internet can be considered a WAN.

Wi-Fi

Short for “Wireless Fidelity”. Wi-Fi refers to wireless networking technology that devices to communicate over a wireless signal.

Wireless Access Point (WAP)

A device that allows wireless devices to connect to a wired network. May be free-standing or built into a router.

Wireless Internet

Provides access to Internet services and other internal devices in the home via a wire-free connection to a home Router using short-range radio transmission.

Wireless Local Area Network (WLAN)

Network connecting two or more devices wirelessly, usually also providing access to the Internet.

Zone (audio/lighting/heating)

Group of lights, speakers, sensors or other devices that work together and are controlled as one group.

03 FREQUENTLY ASKED QUESTIONS

As the home technology industry grows, so does the client's search for answers to some frequently asked questions. Use the messages below to give clients some context about the industry and the solutions your company can offer.

What is home integration?

The meaning of this term can vary depending on who is using it. Other related terms include home networking, home automation, residential electronic systems, and smart homes.

When CEDIA Members talk about integration, they are referring to the ability to integrate television, home cinema, lighting control, multi-room audio, HVAC, security, appliances, and other systems through a centrally controlled network. These systems are custom designed to allow the homeowner the convenient, time-saving, and cost-saving benefits of controlling electronics through a central control, or even remotely.

Many think of home networking as simply connecting PCs. While this is a growing segment, it's only the tip of the iceberg in terms of what can be connected in a home. CEDIA Members are on the cutting edge of connecting home technology systems for consumers. And more consumers are demanding the benefits of connectivity – in convenience, safety, and lifestyle enhancement.

How big is the home integration market?

Since there is no universal definition of home integration, it's difficult to measure the size of the market. However, the number of homeowners who have embraced home connectivity has grown tremendously in the past decade as newer and less expensive technologies have been developed and consumer awareness has grown. More homeowners are beginning to understand the value of these systems in providing security, comfort, and cost-savings to their families.

What are the benefits of home networking and home automation?

According to CEDIA Members and industry research, those who have integrated homes or are interested in integrating technology into their home view these systems as a way to save time and spend more quality time with their families. Most customers invest

in home technology systems for the benefits, not for the sake of owning technology.

Will networked homes become outdated quickly? How can you make sure you are up to date?

CEDIA Members are on the cutting-edge of technology and develop systems that are practical and pragmatic for today's homeowners and can take advantage of new innovations as they come to market. CEDIA Members stay at the forefront of industry trends and up-and-coming technology through continuing education and professional development as well as networking with leading manufacturers at industry events. This up-to-date knowledge allows them to deliver technology that will not only merge seamlessly with the client's existing lifestyle but will also provide convenience, security, and entertainment for years to come.

Can homeowners install their own residential electronic systems?

Many mass-market retailers provide do-it-yourself home networking kits or cinema-in-a-box products. While consumers can often install these products, CEDIA Members provide significant value to homeowners interested in a networked solution. CEDIA Professionals' deep product knowledge allows them to select the best audio visual components to suit a client's home design and usage patterns. They have the skill to optimise room acoustics and seating and calibrate video settings beyond the capabilities of the casual hobbyist. They can work with the homeowner to develop a plan – much like an architect draws out a house plan – to ensure the best integrated home experience.

Home technology systems designed by CEDIA Members are a sound investment in the value of a client's home. These systems are developed to handle a customer's needs today, as well as expand to meet the needs of tomorrow.

What are the benefits of hiring a CEDIA Certified professional?

CEDIA is the world's leading association of Home Technology Professionals (HTPs) and provides the industry's most comprehensive education to its membership. Members who participate and excel in CEDIA's educational programs can undergo rigorous testing to earn CEDIA Certification

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credentials. Consumers can rest assured that CEDIA Certified individuals are the most highly respected and experienced in the industry. More than 5,000 professionals have earned the CEDIA Certification designation to date.

CEDIA Member companies subscribe to a strict set of code of professional conduct and ethics, and stay abreast of the latest technological innovations. This expertise is what consumers are looking for.

When it comes to home technology systems and integration, what are some things homeowners should keep in mind as they build a home?

Consumers should work with an architect, builder, or interior designer who sees the benefit of consulting a CEDIA Professional. The beginning stage of the design/build process is the optimal time to think about wiring a home for connectivity and designing your space to account for your future home integration needs.



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