

# IDC Glossary

## A

- **A/D Conversion Time**
- This is the length of time a board requires to convert an analog signal into a digital value. The theoretical maximum speed (conversions/second) is the inverse of this value. See Speed/Typical Throughput.
- **A/D**
- Analog to digital conversion.
- **Absolute Addressing**
- A mode of addressing containing both the instruction and location (address) of data.
- **Accuracy**
- Closeness of indicated or displayed value to the ideal measured value.
- **AACK**
- Acknowledge (ASCII - control F).
- **Acknowledge**
- A handshake line, which is used by the receiving device to indicate that it, has read the transmitted data.
- **Active Device**
- Device capable of supplying current for a loop.
- **Active Filter**
- A combination of active circuit devices (usually amplifiers), with passive circuit elements (resistors and capacitors), which have characteristics that more closely match ideal filters than do passive filters.
- **Actuator Control**
- element or device used to modulate (or vary) a process parameter.
- **Address**
- A normally unique designator for location of data or the identity of peripheral device, which allows each device on a single communications, lines to respond to its own message.
- **Address Register**
- A register that holds the address of a location containing a data item called for by an instruction.
- **AFC Automatic Frequency Control.**
- The circuit in a radio receiver that automatically keeps the carrier frequency centred in the passband of the filters and demodulators.
- **Algorithm**
- Can be used as a basis for writing a computer program. This is a set of rules with a finite number of steps for solving a problem.
- **Alias Frequency**
- A false lower frequency component that appears in data reconstructed from original data acquired at an insufficient sampling rate (less than two times the maximum frequency of the original data).
- **ALU**

- See Arithmetic Logic Unit.
- **Amplitude Modulation**
- A modulation technique (also referred to as AM or ASK) used to allow data to be transmitted across an analog network, such as a switched telephone network. The amplitude of a single (carrier) frequency is varied or modulated between two levels; one for binary 0 and one for binary 1.
- **Analog**
- A continuous real-time phenomenon in which the information values are represented in a variable and continuous waveform.
- **Analog Input Board**
- Printed Circuit Board which converts incoming analog signals to digital values.
- **ANSI**
- American National Standards Institute. The principal standards development body in the USA.
- **Apogee**
- The point in an elliptical orbit that is furthest from Earth.
- **Appletalk**
- A proprietary computer-networking standard initiated by the Apple Computer for use in connecting the Macintosh range of computers and peripherals (including Laser Writer printers). This standard operates at 230 kilobits/second.
- **Application Program**
- A sequence of instructions written to solve a specific problem facing organizational management. These programs are normally written in a high-level language and draw on resources of the operating system and the computer hardware in executing its tasks.
- **Application Layer**
- The highest layer of the seven layer ISO/OSI Reference Model structure, which contains all user or application programs.
- **Arithmetic Logic Unit**
- The element(s) in a processing system that perform(s) the mathematical functions such as addition, subtraction, multiplication, division, inversion, AND, OR, NAND AND NOR.
- **ARP**
- Address Resolution Protocol. A Transmission Control Protocol/Internet Protocol (TCP/IP) process that maps an IP address to Ethernet address required by TCP/IP for use with Ethernet.
- **ARQ**
- Automatic Request for Transmission. A request by the receiver for the transmitter to retransmit a block or a frame because of errors detected in the originally received message.
- **AS**
- Australian Standard.
- **ASCII**
- American Standard Code for Information Interchange. A universal standard for encoding alphanumeric characters into 7 or 8 binary bits. Drawn up by ANSI to ensure compatibility between different computer systems.
- **ASIC**
- Application Specific Integrated Circuit.
- **ASK**
- Amplitude Shift Keying. See Amplitude Modulation.

- **ASN.1**
- Abstract Syntax Notation One. An abstract syntax used to define the structure of the protocol data units associated with a particular protocol entity.
- **Asynchronous**
- Communications in which characters can be transmitted at an arbitrary, unsynchronized time and where the time intervals between transmitted characters may be of varying lengths. Communication is controlled by start and stop bits at the beginning and end of each character.
- **Attenuation**
- The decrease in signal magnitude or strength between two points.
- **Attenuator**
- A passive network that decreases the amplitude of a signal (without introducing any undesirable characteristics to the signals such as distortion).
- **AUI CABLE**
- Attachment Unit Interface Cable. Sometimes called the drop cable to attach terminals to the transceiver unit.
- **Auto Tracking Antenna**
- A receiving antenna that moves in synchronism with the transmitting device which is moving (such as a vehicle being telemetered).
- **Autoranging**
- An autoranging board can be set to monitor the incoming signal and automatically select an appropriate gain level based on the previous incoming signals.
- **AWG**
- American Wire Gauge

## B

- **Background Program**
- An application program that can be executed whenever the facilities of the system are not needed by a higher priority program.
- **Backplane**
- A panel containing sockets into which circuit boards (such as I/O cards, memory boards and power supplies) can be plugged.
- **Balanced Circuit**
- A circuit so arranged that the impressed voltages on each conductor of the pair are equal in magnitude but opposite in polarity with respect to a defined reference.
- **Band Pass Filter**
- A filter that allows only a fixed range of frequencies to pass through. All other frequencies outside this range (or band) are sharply reduced in magnitude.
- **Band Reject**
- A circuit that rejects a defined frequency band of a signal while passing all signals outside this frequency range (both lower than and higher than).
- **Bandwidth**
- The range of frequencies available expressed as the difference between the highest and lowest frequencies, in hertz (cycles per second, abbreviated Hz).

- **Bar Code Symbol**
- An array of rectangular parallel bars and spaces of various widths designed for the labelling of objects with unique identifications, A\llbar code symbol contains a leading quiet zone, a start character, one or more data characters including, in some cases, a check character, a stop character, and a trailing quiet zone.
- **Base Address**
- A memory address that serves as the reference point. All other points are located by offsetting in relation to the base address.
- **Base Band**
- Base Band operation is the direct transmission of data over a transmission medium without the prior modulation on a high frequency carrier band.
- **Base Loading**
- An inductance situated near the bottom end of a vertical antenna to modify the electrical length. This aids in impedance matching.
- **Baud**
- Unit of signaling speed derived from the number of events per second (normally bits per second). However, if each event has more than one bit associated with it, the baud rate and bits per second are not equal.
- **Baudot**
- Data transmission code in which five bits represents one character. Sixty-four alphanumeric characters can be represented. This code is used in many teleprinter systems with one start bit and 1.42 stop bits added.
- **BCC**
- Block Check Character. Error checking scheme with one check character; a good example being Block Sum Check.
- **BCD**
- Binary Coded Decimal. A code used for representing decimal digits in a binary code.
- **BEL**
- Bell (ASCII for control-G).
- **BERT/BLERT**
- Bit Error Rate/Block Error Rate Testing. An error checking technique that compares a received data pattern with a known transmitted data pattern to determine transmission line quality.
- **Bifilar**
- Two conducting elements used in parallel (such as two parallel wires wound on a coil form).
- **Binary Coded Decimal (BCD)**
- A code used for representing decimal digits in a binary code.
- **BIOS**
- The basic input/output system for the computer usually firmware-based. This program handles the interface with the PC hardware and isolates the Operating Software (OS) from the low-level activities of the hardware. Consequently, application software becomes more independent of the particular specifications of the hardware on which it runs, and hence more portable.
- **Bisynchronous**
- Transmission See BSC.
- **Bit Stuffing**
- A technique used to allow pure binary data to be transmitted on a zero bit insertion synchronous transmission line. Each message block (frame) is encapsulated between two flags that are special bit sequences. Then if the message data contains a possibly similar sequence, an additional (zero) bit is inserted into the data stream by the sender, and is subsequently removed by the receiving device. The transmission method is then said to be data transparent.

- **BIT**
- Derived from "Binary Digit", a one or zero condition in the binary system.
- **Bits & Bytes**
- One bit is one binary digit, either a binary 0 or 1. One byte is the amount of memory needed to store each character of information (text or numbers). There are eight bits to one byte (or character), and there are 1024 bytes to one kilobyte (KB). There are 1024 kilobytes to one megabyte (MB). Data acquisition boards typically take 2-byte samples; a board acquiring data at a 20x11k Hz-sample rate is actually gathering 40,000 bytes of data per second.
- **Block**
- In block-structured programming languages, a section of programming languages or a section of program coding treated as a unit.
- **Block Sum Check**
- This is used for the detection of errors when data is being transmitted. It comprises a set of binary digits (bits) which are the modulo 2 sum of the individual characters or octets in a frame (block) or message.
- **BNC**
- Bayonet type coaxial cable connector.
- **BPS**
- Bits per second. Unit of data transmission rate.
- **Bridge**
- A device to connect similar sub-networks without its own network address. Used mostly to reduce the network load.
- **Broad Band**
- A communications channel that has greater bandwidth than a voice grade line and is potentially capable of greater transmission rates.
- **Broadcast**
- A message on a bus intended for all devices, which requires no reply.
- **BS**
- Backspace (ASCII control-H).
- **BS**
- British Standard.
- **BSC**
- Bisynchronous Transmission. A byte or character oriented communication protocol that has become the industry standard (created by IBM). It uses a defined set of control characters for synchronized transmission of binary coded data between stations in a data communications system.
- **Bubble Memory**
- Describes a method of storing data in memory where data is represented as magnetized spots called magnetic domains that rest on a thin film of semiconductor material. Normally used in high-vibration, high-temperature or otherwise harsh industrial environments.
- **Buffer**
- An intermediate temporary storage device used to compensate for a difference in data rate and data flow between two device (also called a \spooler for interfacing a computer and a printer).
- **Burst Mode**
- A high-speed data transfer in which the address of the data is sent followed by back to back data words while a physical signal is asserted.
- **Bus**

- A data path shared by many devices, with one or more conductors for transmitting signals, data or power.
- **Byte**
- A term referring to eight associated bits of information; sometimes called a "character".

## C

- **Cache Memory**
- A fast buffer memory that fits between the CPU and the slower main memory to speed up CPU requests for data.
- **Capacitance**
- (mutual) The capacitance between two conductors with all other conductors, including shield, short-circuited to the ground.
- **Capacitance**
- Storage of electrically separated charges between two plates having different potentials. The value is proportional to the surface area of the plates and inversely proportional to the distance between them.
- **Cascade**
- Two or more electrical circuits in which the output of one is fed into the focus of the parabola.
- **Cassegrain**
- Antenna Parabolic antenna that has a hyperbolic passive reflector situated at the focus of the parabola.
- **CCD**
- Charge-Coupled Device (camera).
- **CCIR**
- Comité Consultatif International des Radiocommunications.
- **CCIT**
- Consultative Committee International Telegraph and Telephone. An international association that sets worldwide standards (eg. V.21, V.22, V.22bis).
- **Cellular Polyethylene**
- Expanded or "foam" polyethylene consisting of individual closed cells suspended in a polyethylene medium.
- **CGA**
- Colour Graphics Adaptor. A computer standard using digital signals offering a resolution of 320 by 200 pixels, a palette of 16 colors.
- **Channel Sector**
- In an FM discriminator the plug-in module which causes the device to select one of the channels and demodulate the subcarrier to recover data.
- **Character**
- Letter, numeral, punctuation, control figure or any other symbol contained in a message.
- **Characteristic Impedance**
- The impedance that, when connected to the output terminals of a transmission line of any length, makes the line appear infinitely long. The ratio of voltage to current at every point along a transmission line on which there are no standing waves.
- **Clock**

- The source of timing signals for sequencing electronic events such as synchronous data transfer or CPU operation in a PC.
- **Clock Pulse**
  - A rising edge, then a falling edge (in that order) such as applied to the clock input of 8254 timer/counter.
- **Closed Loop**
  - A signal path that has a forward route for the signal, a feedback network for the signal and a summing point.
- **CMRR**
  - Common Mode Rejection Ratio - A board's ability to measure only the voltage difference between the leads of a transducer, rejecting what the leads have in common. The higher the CMRR, the better the accuracy.
- **CMV**
  - Common Mode Voltage
- **CNR**
  - Carrier to Noise Ratio. An indication of the quality of the modulated signal.
- **Cold-junction Compensation**
  - Thermocouple measurements can easily be affected by the interface the thermocouples are connected to. Cold-junction compensation circuitry compensates for inaccuracies introduced in the conversion process.
- **Collector**
  - The voltage source in a transistor with the base as the control source and the emitter as the controlled output.
- **Collision**
  - The situation when two or more LAN nodes attempt to transmit at the same time.
- **Common Carrier**
  - A private data communications utility company that furnishes communications services to the public.
- **Common Mode**
  - A measure of the ability of an instrument to reject interference caused rejection ratio by a voltage common to its input terminals relative to ground; expressed in dB.
- **Common Mode Signal**
  - The common voltage to the two parts of a differential signal applied to a balanced circuit.
- **Commutator**
  - A device used to effect time-division multiplexing by repetitive sequential switching.
- **Compiler**
  - Programs to convert high-level source code (such as BASIC) to machine code-executable form, suitable for the CPU.
- **Composite Link**
  - The line or circuit that connects a pair of multiplexers or concentrators, with the circuit carrying multiplexed data.
- **Composite**
  - A video signal that contains all the intensity, color and timing information necessary for a video product.
- **Conical Scan Antenna**
  - An automatic tracking antenna system in which the beam is steered in a circular path so that it forms a cone.
- **Contention**
  - The facility provided by the dial network or a data PABX which allows multiple terminals to compete on a first come, first served basis for a smaller number of computer posts.

- **Control System**
- A system in which a series of measured values are used to make a decision on manipulating various parameters in the system to achieve a desired value of the original measured values.
- **Convolution**
- An image enhancement technique in which each pixel is subjected to a mathematical operation that groups it with its nearest neighbours and calculates its value accordingly.
- **Correlator**
- A device that compares two signals and indicates the similarity between the two signals.
- **Counter/Timer Trigger**
- On-board counter/timer circuitry can be set to trigger data acquisition at a user-selectable rate and for a particular length of time.
- **Counter Data Register**
- The 8-bit register of an (8254 chip) timer/counter that corresponds to one of the two bytes in the counter's output latch for read operations and count register for write operations.
- **CPU**
- Central Processing Unit.
- **CR**
- Carriage Return (ASCII control-M).
- **CRC**
- Cyclic Redundancy Check. An error-checking mechanism using a polynomial algorithm based on the content of a message frame at the transmitter and included in a field appended to the frame. At the receiver, it is then compared with the result of the calculation that is performed by the receiver. Also referred to as CRC-16.
- **Cross Talk**
- A situation where signals from a communication channel interferes with an associated channel's signals.
- **Crossed Pinning**
- Wiring configuration that allows two DTE or DCE devices to communicate. Essentially, it involves connecting pin 2 to pin 3 of the two devices.
- **Crossover**
- In communications, a conductor which runs through the cable and connects to a different pin number at each end.
- **CSMA/CD**
- Carrier Sense Multiple Access/Collision Detection. When two situations transmit at the same time on a local area network, they both cease transmission and signal that a collision has occurred. Each then tries again after waiting for a predetermined time period.
- **Current Sink**
- This is the amount of current the board can supply for digital output signals. With 10-12x11mA or more of current sink capability, a board can turn relays on and off. Digital I/O boards with less than 10-2x11mA of sink capability are designed for data transfer only, not for hardware power relay switching.
- **Current Loop**
- A communication method that allows data to be transmitted over a longer distance with a higher noise immunity level than with the standard RS-232C voltage method. A mark (a binary 1) is represented by current; and a space (or binary 0) is represented by the absence of current.
- **Current Inputs**
- A board rated for current inputs can accept and convert analog current levels directly, without conversion to voltage.



# • D

- **D/A**
  - Digital to Analog
- **DAS**
  - Data Acquisition System.
- **Data Integrity**
  - A performance measure based on the rate of undetected errors.
- **Data Reduction**
  - The process of analyzing a large quantity of data in order to extract some statistical summary of the underlying parameters.
- **Data Link Layer**
  - This corresponds to layer 2 of the ISO Reference Model for open systems interconnection. It is concerned with the reliable transfer of data (no residual transmission errors) across the data link being used.
- **Datagram**
  - A type of service offered on a packet-switched data network. A datagram is a self contained packet of information that is sent through the network with minimum protocol overheads.
- **dB<sub>i</sub>**
  - A unit that is used to represent the gain of an antenna compared to the gain of an isotropic radiator.
- **dB<sub>m</sub>**
  - A signal level that is compared to a 1-mW reference.
- **dB<sub>mV</sub>**
  - A signal amplitude that is compared to a 1-mV reference.
- **dB<sub>W</sub>**
  - A signal amplitude that is compared to a 1-Watt reference.
- **DCE**
  - Data Communications Equipment. Devices that provide the functions required to establish, maintain and terminate a data transmission connection. Normally it refers to a modem.
- **Decibel**
  - A logarithmic measure of the ratio of two signal levels where  $dB_{11} = 10 \log_{10} V_1/V_2$  or where  $dB_{11} = 10 \log_{10} P_1/P_2$  and where V refers to Voltage or P refers to Power. Being a ratio, it has no units to measure.
- **Decoder**
  - A device that converts a combination of signals into a single signal representing that combination.
- **Decommutator**
  - Equipment for the demultiplexing of commutated signals.
- **Default**
  - A value or setup condition assigned automatically unless another is specified.
- **Delay**

- Distortion Distortion of a signal caused by the frequency components making up the signal having different propagation velocities across a transmission medium.
- **DES**
- Data Encryption Standard.
- **Deviation**
- A movement away from a required value.
- **DFB**
- Display Frame Buffer.
- **Diagnostic Program**
- A utility program used to identify hardware and firmware defects related to the PC.
- **Dielectric Constant (E) The**
- ratio of the capacitance using the material in question as the dielectric, to the capacitance resulting when the material is replaced by air.
- **Differential**
- See Number of channels.
- **Digital**
- A signal which has definite states (normally two).
- **Digitise**
- The transformation of an analog signal to a digital signal.
- **DIN**
- Deutsches Institut Fur Normierung.
- **DIP**
- Acronym for dual in line package referring to integrated circuits and switches.
- **Diplexing**
- A device used to allow simultaneous reception or transmission of two signals on a common antenna.
- **Direct Memory Access**
- A technique of transferring data between the computer memory and a device on the computer bus without the intervention of the microprocessor. Also Abbreviated to DMA.
- **Discriminator**
- Hardware device to demodulate a frequency modulated carrier or subcarrier to produce analog data.
- **Dish Antenna**
- An antenna in which a parabolic dish acts a reflector to increase the gain of the antenna.
- **Dish**
- Concave antenna reflector for use at VHF or higher frequencies.
- **Diversity Reception**
- Two or more radio receivers connected to different antennas to improve signal quality by using two different radio signals to transfer the information.
- **DLE**
- Data Link Escape (ASCII character).
- **DMA**

- Direct Memory Access.
- **DNA**
- Distributed Network Architecture.
- **Doppler**
- The change in observed frequency of a signal caused by the emitting device moving with respect to the observing device.
- **Downlink**
- The path from a satellite to an earth station.
- **DPI**
- Dots per inch.
- **DPLL**
- Digital Phase Locked Loop.
- **DR**
- Dynamic Range. The ratio of the full scale range (FSR) of a data converter to the smallest difference it can resolve.  $DR = \frac{FSR}{\Delta}$  where  $\Delta$  is the resolution in bits.
- **DRAM**
- Dynamic Random Access Memory. See RAM.
- **Drift**
- A gradual movement away from the defined input/output condition over a period of time.
- **Driver Software**
- A program that acts as the interface between a higher level coding structure and the lower level hardware/firmware component of a computer.
- **DSP**
- Digital Signal Processing.
- **DSR**
- Data Set Ready. An RS-232 modem interface control signal which indicates that the terminal is ready for transmission.
- **DTE**
- Data Terminal Equipment. Devices acting as data source, data sink, or both.
- **Dual-ported RAM**
- Allows acquired data to be transferred from on-board memory to the computer's memory while data acquisition is occurring.
- **Duplex**
- The ability to send and receive data over the same communications line.
- **Dynamic Range**
- The difference in decibels between the overload or maximum and minimum discernible signal level in a system.

# E

- **EBCDIC**

- Extended Binary Coded Decimal Interchange Code. An 8-bit character code used primarily in IBM equipment. The code allows for 256 different bit patterns.
- **EEPROM**
- Electrically Erasable Programmable Read Only Memory. This memory unit can be erased by applying an electrical signal to the EEPROM and then reprogrammed.
- **EGA**
- Enhanced Graphics Adapter. A computer display standard that provides a resolution of 640 by 350 pixels, a palette of 64 colors, and the ability to display as many as 16 colors at one time.
- **EIA**
- Electronic Industries Association. An organization in the USA specializing in the electrical and functional characteristics of interface equipment.
- **EIA-232-C**
- Interface between DTE and DCE, employing serial binary data exchange. Typical maximum specifications are 15m at 19200 Baud.
- **EIA-423**
- Interface between DTE and DCE, employing the electrical characteristics of unbalanced voltage digital interface circuits.
- **EIA-449**
- General purpose 37 pin and 9 pin interface for DCE and DTE employing serial binary interchange.
- **EIA-485**
- The recommended standard of the EIA that specifies the electrical characteristics of drivers and receivers for use in balanced digital multipoint systems.
- **EIRP**
- Effective Isotropic Radiated Power. The effective power radiated from a transmitting antenna when an isotropic radiator is used to determine the gain of the antenna.
- **EISA**
- Enhanced Industry Standard Architecture.
- **EMI/RFI**
- Electro-Magnetic Interference or Radio Frequency Interference. Background 'noise' capable of modifying or destroying data transmission.
- **EMS**
- Expanded Memory Specification.
- **Emulation**
- The imitation of a computer system performed by a combination of hardware and software that allows programs to run between incompatible systems.
- **Enabling**
- The activation of a function of a device by a defined signal.
- **Encoder**
- A circuit which changes a given signal into a coded combination for purposes of optimum transmission of the signal.
- **ENQ**
- Enquiry (ASCII Control-E)
- **EOT**

- End of Transmission (ASCII Control-D)
- **EPROM**
- Erasable Programmable Read Only Memory. Non-volatile semiconductor memory that is erasable in an ultra violet light and reprogrammable.
- **Equaliser**
- The device which compensates for the unequal gain characteristic of the signal received.
- **Error Rate**
- The ratio of the average number of bits that will be corrupted to the total number of bits that are transmitted for a data link or system.
- **Error**
- The difference between the setpoint and the measured value.
- **ESC**
- Escape (ASCII character)
- **ESD**
- Electrostatic Discharge.
- **Ethernet**
- Name of a widely used Local Area Network (LAN), based on the CSMA/CD bus access method (IEEE 802.3)
- **ETX**
- End of Text (ASCII Control-C).
- **Even Parity**
- A data verification method normally implemented in hardware in which each character must have an even number of ON bits.
- **External Pulse Trigger**
- Many of the A/D boards allow sampling to be triggered by a voltage pulse from an external source.

## F

- **Fan In**
- The load placed on a signal line by a logic circuit input.
- **Fan Out**
- The measure of drive capability of a logic circuit output.
- **Farad**
- Unit of capacitance whereby a charge of one coulomb produces a one volt potential difference.
- **FCC**
- Federal Communications Commission (USA).
- **FCS**
- Frame Check Sequence. A general term given to the additional bits appended to a transmitted frame or message by the source to enable the receiver to detect possible transmission errors.
- **FDM**

- Frequency Division Multiplexer. A device that divides the available transmission frequency range in narrower bands, each of which is used for a separate channel.
- **Feedback**
  - A part of the output signal being fed back to the input of the amplifier circuit.
- **Field**
  - One half of a video image (frame) consisting of 312.5 lines (for PAL). There are two fields in a frame. Each is shown alternately every 1/25 of a second (for PAL).
- **FIFO**
  - First in, First Out.
- **Filled Cable**
  - A telephone cable construction in which the cable core is filled with a material that will prevent moisture from entering or passing along the cable.
- **FIP**
  - Factory Instrumentation Protocol.
- **Firmware**
  - A computer program or software stored permanently in PROM or ROM or semi-permanently in EPROM.
- **Flame Retardancy**
  - The ability of a material not to propagate flame once the flame source is removed.
- **Floating**
  - An electrical circuit that is above the earth potential.
- **Flow Control**
  - The procedure for regulating the flow of data between two device preventing the loss of data once a device's buffer has reached its capacity.
- **Frame**
  - A full video image comprising two fields. A PAL frame has a total of 625 lines (an NTSC frame has 525 lines).
- **Frame Grabber**
  - An image processing peripheral that samples, digitizes and stores a television camera frame in computer memory.
- **Frequency Modulation**
  - A modulation technique (abbreviated to FM) used to allow data to be transmitted across an analogue network where the frequency is varied between two levels - one for binary '0' and one for binary '1'. Also known as Frequency Shift Keying (FSK).
- **Frequency**
  - Refers to the number of cycles per second.
- **Frequency Domain**
  - The displaying of electrical quantities versus frequency.
- **Fringing**
  - The unwanted bordering of an object or character with weak colors when there should be a clearly delineated edge.
- **Full Duplex**
  - Simultaneous two way independent transmission in both directions (4 wire). See Duplex.

# G

- **Gain of Antenna**
  - The difference in signal strengths between a given antenna and a reference isotropic antenna.
- **Gain Amplification**
  - Applied to an incoming signal, gain acts as a multiplication factor on the signal, enabling a board to use signals that would otherwise be too weak. For example, when set to a gain to 10, a board with a range of  $+0.5 \times 11V$  can use raw input signals as low as  $+0.5 \times 11V$ ; with a gain of 20, the range extends down to  $+250 \times 11mV$ .
- **Gateway**
  - A device to connect two different networks which translates the different protocols.
- **Genlock**
  - This is the process of synchronizing one video signal to a master reference, ensuring that all signals will be compatible or related to one another.
- **Geostationary**
  - A special earth orbit that allows a satellite to remain in a fixed position above the equator.
- **Geosynchronous**
  - Any earth orbit in which the time required for one revolution of satellite is an integral portion of a sidereal day.
- **GPIB**
  - General Purpose Interface Bus. An interface standard used for parallel data communication, usually used for controlling electronic instruments from a computer. Also designated IEEE-488 standard.
- **Graphics Mode**
  - In graphics mode each pixel on a display screen is addressable, and each pixel has a horizontal (or X) and a vertical (or Y) coordinate.
- **Grey Scale**
  - In image processing, the range of available grey levels. In an 8-bit system, the grey scale contains values from 0 to 255.
- **Ground**
  - An electrically neutral circuit having the same potential as the earth. A reference point for an electrical system also intended for safety purposes.

# H

- **Half Duplex**
  - Transmissions in either direction, but not simultaneously.
- **Half Power Point**
  - The point in a Power versus frequency curve which is half the power level of the peak power (also called the  $sdB$  point).
- **Hamming Distance**
  - A measure of the effectiveness of error checking. The higher the Hamming Distance (HD) index, the safer is the data transmission.

- **Handshake Lines**
- Dedicated signals which allow two different devices to exchange data under synchronous hardware control.
- **Handshaking**
- Exchange of predetermined signals between two devices establishing a connection.
- **Harmonic**
- An oscillation of a periodic quantity whose frequency is an integral multiple of the fundamental frequency. The fundamental frequency and the harmonics together form a Fourier series of the original wave form.
- **Harmonic**
- Distortion Distortion caused by the presence of harmonics in the desired signal.
- **HDLC**
- High Level Data Link Control. The international standard communication protocol defined by ISO to control the exchange of data across either a point-to-point data link or a multidrop data link.
- **Hertz (Hz)**
- A term replacing cycles per second as a unit of frequency.
- **Hex**
- Hexadecimal.
- **Hexadecimal Number**
- A base 16 number system commonly used with Personal Computer system.
- **HF**
- High Frequency.
- **High Pass**
- Generally referring to filters which allow signals above a specified frequency to pass but attenuate signals below this specified frequency.
- **High-Pass Filter**
- See HPF
- **Histogram**
- A graphic representation of a distribution function, such as frequency, by means of rectangles whose widths represent the intervals into which the range of observed values is divided and whose heights represent the number of observations occurring in each interval.
- **Horn**
- A moderate-gain wide-beamwidth antenna.
- **Host**
- This is normally a computer belonging to a user that contains (hosts) the communication hardware and software necessary to connect the computer to a data communication network.
- **HPF**
- High-Pass Filter. A filter processing one transmission band that extends from a cutoff frequency (other than zero) to infinity.
- **HPIB**
- Hewlett-Packard Interface Bus; trade name used by Hewlett-Packard for its implementation of the IEEE-488 standard.



# I

- **I/O Address**
  - A method that allows the CPU to distinguish between different boards in a system. All boards must have different addresses.
- **IEC**
  - International Electrical Commission.
- **IEE**
  - Institution of Electrical Engineers.
- **IEEE**
  - Institute of Electrical and Electronic Engineers. A US-based international professional society that issues its own standards and, which is a member of ANSI and ISO.
- **Illumination Component**
  - An amount of source light incident on the object being viewed.
- **Impedance**
  - The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of resistance R and reactance X, measure in ohms.
- **Individual Gain Per Channel**
  - A system allowing an individual gain level for each input channel, thereby allowing a much wider range of input levels and types without sacrificing accuracy on low-level signals.
- **Inductance**
  - The property of a circuit element that opposes a change in current flow, thus causing current changes to lag behind voltage changes. It is measured in henrys.
- **Insulation Resistance (IR)**
  - The resistance offered by an insulation to an impressed dc voltage, tending to produce a leakage current through the insulation.
- **Interface**
  - A shared boundary defined by common physical interconnection characteristics, signal characteristics and measuring of interchanged signals.
- **Interlace**
  - This is the display of two fields alternately with one field filling in the blank lines on the other field so that they interlock. The PAL standard displays 25 video frames per second.
- **Interlaced**
  - Interlaced - describing the standard television method of raster scanning, in which the image is the product of two fields, each of which is a series of successively scanned lines separated by the equivalent of one line. Thus adjacent lines belong to different fields.
- **Interrupt**
  - An external event indicating that the CPU should suspend its current task to service a designated activity.
- **Interrupt Handler**
  - The section of the program that performs the necessary operation to service an interrupt when it occurs.
- **IP**

- Internet Protocol.
- **ISA**
- Industry Standard Architecture (for IBM Personal Computers).
- **ISA**
- Instrument Society of America.
- **ISB**
- Intrinsically Safe Barrier.
- **ISDN**
- Integrated Services Digital Network. The new generation of world-wide telecommunications network that utilizes digital techniques for both transmission and switching. It supports both voice and data communications.
- **ISO**
- International Standards Organization.
- **Isolation**
- Electrical separation of two circuits. For example, optical isolation allows a high-voltage signal to be transferred to a low-voltage input without electrical interactions.
- **Isotropic Antenna**
- A reference antenna that radiates energy in all directions from a point source.
- **ISR**
- Interrupt Service Routine. See Interrupt Handler.
- **ITU**
- International Telecommunications Union.

## J

- **Jabber**
- Garbage that is transmitted when a LAN node fails and then continuously transmits.
- **Jumper**
- A wire connecting one or more pins on the one end of a cable only.

## K

- **k (kilo)**
- This is 210 or 1024 in computer terminology, e.g. 1kB = 1024 bytes.
- **K**
- In computer terminology, a K is 210 = 1024. This distinguishes it from the SI unit k (kilo) which is 1000.]

# L

- **LAN**
- Local Area Network. A data communications system confined to a limited geographic area typically about 10 kms with moderate to high data rates (100kbps to 50 Mbps). Some type of switching technology is used, but common carrier circuits are not used.
- **LCD**
- Liquid Crystal Display. A low power display system used on many laptops and other digital equipment.
- **LDM**
- Limited Distance Modem. A signal converter which conditions and boosts a digital signal so that it may be transmitted further than a standard EIA-232 signal.
- **Leased (or Private) Line**
- A private telephone line without inter-exchange switching arrangements.
- **LED**
- Light Emitting Diode. A semi-conductor light source that emits visible light or infra-red radiation.
- **LF**
- Line feed. (ASCII control-J)
- **Line Driver**
- A signal converter that conditions a signal to ensure reliable transmission over an extended distance.
- **Line Turnaround**
- The reversal of transmission direction from transmitter to receiver or vice versa when a half duplex circuit is used.
- **Linearity**
- A relationship where the output is directly proportional to the input.
- **Link Layer**
- Layer 2 of the OSI reference model; also known as the data link layer.
- **Listener**
- A device on the GPIB bus that receives information from the bus.
- **LLC**
- Logical Link Control (IEEE 802).
- **Loaded Line**
- A telephone line equipped with loading coils to add inductance in order to minimize amplitude distortion.
- **Long Wire**
- A horizontal wire antenna that is one wavelength or greater in size.
- **Loop Resistance**
- The measured resistance of two conductors forming a circuit.
- **Loopback**
- Type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all, or a portion, of a data communication link or network. A loopback test permits the comparison of a returned signal with the transmitted signal.

- **Low Pass**
- Generally referring to filters which allow signals below a specified frequency to pass but attenuate a signal above this specified frequency.
- **Low-Pass Filter**
- See LPF.
- **LPF**
- Low-Pass Filter. A filter processing one transmission band, extending from zero to a specific cutoff frequency.
- **LSB**
- Least Significant Byte or Least Significant Bit.
- **Luminance**
- The black and white portion of a video signal which supplies brightness and detail for the picture.
- **LUT**
- Look-Up Table. This refers to the memory that stores the values for the point processes. Input pixel values are those for the original image whilst the output values are those displayed on the monitor as altered by the chosen point processes.
- **Lux**
- SI unit of luminous incidence of illuminance, equal to one lumen per square metre.
- **Lux-second**
- SI unit of light exposure.]

# M

- **m**
- meter. Metric system for length.
- **M**
- Mega. Metric system prefix for 10<sup>6</sup>.
- **MAC**
- Media Access Control (IEEE 802).
- **Manchester Encoding**
- Digital technique (specified for the IEEE-802.3 Ethernet baseband network standard) in which each bit period is divided into two complementary halves; a negative to positive voltage transition in the middle of the bit period designates a binary '1', whilst a positive to negative transition represents a '0'. The encoding technique also allows the receiving device to recover the transmitted clock from the incoming data stream (self clocking).
- **MAP**
- Manufacturing Automation Protocol. A suite of network protocols originated by General Motors which follow the seven layers of the OSI model. A reduced implementation is referred to as a mini-MAP.
- **MAP 3.0**
- Standard profile for manufacturing developed to MAP.
- **Mark**
- This is equivalent to a binary 1.
- **Mask**

- A structure covering certain portions of a photo-sensitive medium during photographic processing.
- **Masking**
- Setting portions of an image at a constant value, either black or white. Also the process of outlining an image and then matching it to test images.
- **Master/Slave**
- Bus access method whereby the right to transmit is assigned to one device only, the Master, and all the other devices, the Slaves may only transmit when requested.
- **Master Oscillator**
- The primary oscillator for controlling a transmitter or receiver frequency. The various types are: Variable Frequency Oscillator (VFO); Variable Crystal Oscillator (VXO); Permeability Tuned Oscillator (PTO); Phase Locked Loop (PLL); Linear Master Oscillator (LMO) or frequency synthesizer.
- **Media Access Unit**
- Referred to often as MAU. This is the Ethernet transceiver unit situated on the coaxial cable which then connects to the terminal with a drop cable.
- **Microwave**
- AC signals having frequencies of 1 GHz or more.
- **MIPS**
- Million Instructions per second.
- **MMS**
- Manufacturing Message Services. A protocol entity forming part of the application layer. It is intended for use specifically in the manufacturing or process control industry. It enables a supervisory computer to control the operation of a distributed community of computer based devices.
- **Modem**
- MODulator - DEModulator. A device used to convert serial digital data from a transmitting terminal to a signal suitable for transmission over a telephone channel or to reconvert the transmitted signal to serial digital data for the receiving cables or connections.
- **Modem Eliminator**
- A device used to connect a local terminal and a computer port in lieu of the pair of modems to which they would ordinarily connect, allow DTE to DTE data and control signal connections otherwise not easily achieved by standard cables or connections.
- **Modulation Index**
- The ratio of the frequency deviation of the modulated wave to the frequency of the modulating signal.
- **Morphology**
- The study of a structure/form of object in an image.
- **MOS**
- Metal Oxide Semiconductor.
- **MOV**
- Metal Oxide Varistor.
- **MSB**
- Most Significant Byte or Most Significant Bit.
- **MTBF**
- Mean Time Between Failures.
- **MTTR**

- Mean Time To Repair.
- **Multidrop**
- A single communication line or bus used to connect three or more points.
- **Multiplexer (MUX)**
- A device used for division of a communication link into two or more channels, either by using frequency division or time division.
- **Multiplexer**
- A technique in which multiple signals are combined into one channel. They can then be demultiplexed back into the original components.

# N

- **NAK**
- Negative Acknowledge (ASCII Control-U).
- **Narrowband**
- A device that can only operate over a narrow band of frequencies.
- **Negative True Logic**
- The inversion of the normal logic where the negative state is considered to be TRUE (or 1) and the positive voltage state is considered to be FALSE (or 0).
- **Network Layer**
- Layer 3 in the OSI model; the logical network entity that services the transport layer responsible for ensuring that data passed to it from the transport layer is routed and delivered throughout the network.
- **Network Architecture**
- A set of design principles including the organization of functions and the description of data formats and procedures used as the basis for the design and implementation of a network (ISO).
- **Network**
- An interconnected group of nodes or stations.
- **Network Topology**
- The physical and logical relationship of nodes in a network; the schematic arrangement of the links and nodes of a network typically in the form of a star, ring, tree or bus topology.
- **NMRR**
- Normal Mode Rejection Ratio - The ability of a board to filter out noise from external sources, such as AC power lines. NMRR filtering compensates for transient changes in the incoming signal provide greater accuracy. The higher the NMRR, the better the filtering or incoming data will be.
- **Node**
- A point of interconnection to a network.
- **Noise**
- A term given to the extraneous electrical signals that may be generated or picked up in a transmission line. If the noise signal is large compared with the data carrying signal, the latter may be corrupted resulting in transmission errors.
- **Non-linearity**
- A type of error in which the output from a device does not relate to the input in a linear manner.

- **NRZ**
  - Non Return to Zero. Pulses in alternating directions for successive 1 bits but no change from existing signal voltage for 0 bits.
- **NRZI**
  - Non Return to Zero Inverted.
- **NTSC**
  - National Television System Committee (USA). A television standard specifying 525 lines and 60 fields per second.
- **Null Modem**
  - A device that connects two DTE devices directly by emulating the physical connections of a DCE device.
- **Number of Channels**
  - This is the number of input lines a board can sample. Single-ended inputs share the ground connection, while differential two-wire inputs for each incoming signal, allowing greater accuracy and signal isolation. See also multiplexer.
- **Nyquist Sampling Theorem**
  - In order to recover all the information about a specified signal it must be sampled at least twice at the frequency component of the specified signal.



- **OCR**
  - Optical Character Recognition, optical character reader.
- **ohm**
  - Unit of resistance such that a constant current of one ampere produces a potential difference of one volt across a conductor.
- **OLUT**
  - Output Look-Up Table.
- **On-board Memory**
  - Incoming data is stored in on-board memory before being dumped into the PC's memory. On a high-speed board, data is acquired at a much higher rate than can be written into PC memory, so it is stored in the on-board buffer memory.
- **Optical Isolation**
  - Two networks with no electrical continuity in their connection because an optoelectronic transmitter and receiver has been used.
- **OR**
  - Outside Radius.
- **OSI**
  - Open systems Interconnection. A set of defined protocol layers with a standardized interface which allows equipment from different manufacturers to be connected.
- **Output**
  - An analog or digital output control type signal from the PC to the external 'real world'.
- **Overlay**

- One video signal superimposed on another, as in the case of computer-generated text over a video picture.

# P

- **Packet**
  - A group of bits (including data and call control signals) transmitted as a whole on a packet switching network. Usually smaller than a transmission block.
- **PAD**
  - Packet Access Device. An interface between a terminal or computer and a packet switching network.
- **PAL**
  - Phase Alternating Lines. This is the television standard used in Europe and Australia. The PAL standard is 25 frames per second with 625 lines.
- **Parallel Transmission**
  - The transmission model where multiple data bits are sent simultaneously over separate parallel lines. Accurate synchronization is achieved by using a timing (strobe) signal. Parallel transmission is usually unidirectional; an example would be the Centronics interface to a printer.
- **Parametric Amplifier**
  - An inverting parametric device for amplifying a signal without frequency translation from input to output.
- **Parasitic**
  - Undesirable electrical parameter in a circuit such as oscillations or capacitance.
- **Parity Bit**
  - A bit that is set to a "0" or "1" to ensure that the total number of 1 bits in the data field is even or odd.
- **Parity Check**
  - The addition of non information bits that make up a transmission block to ensure that the total number of bits is always even (even parity) or odd (odd parity). Used to detect transmission errors but rapidly losing popularity because of its weakness in detecting errors.
- **Passive Filter**
  - A circuit using only passive electronic components such as resistors, capacitors and inductors.
- **Passive Device**
  - Device that must draw its power from connected equipment.
- **Path Loss**
  - The signal loss between transmitting and receiving antennas.
- **PBX**
  - Private Branch Exchange.
- **PCIP**
  - Personal Computer Instrument Products.
- **PCM**
  - Pulse Code Modulation. The sampling of a signal and encoding the amplitude of each sample into a series of uniform pulses.
- **PDU**
  - Protocol Data Unit.



- **PEP**
- Peak Envelope Power. Maximum amplitude that can be achieved with any combination of signals.
- **Perigee**
- The point in an elliptical orbit that is closest to earth.
- **Peripherals**
- The input/output and data storage devices attached to a computer e.g. disk drives, printers, keyboards, display, communication boards, etc.
- **Phase Shift Keying**
- A modulation technique (also referred to as PSK) used to convert binary data into an analog form comprising a single sinusoidal frequency signal whose phase varies according to the data being transmitted.
- **Physical Modulation**
- The sine wave or carrier has its phase changed in accordance with the information to be transmitted.
- **Physical Layer**
- Layer 1 of the ISO/OSI Reference Model, concerned with the electrical and mechanical specifications of the network termination equipment.
- **PIA**
- Peripheral Interface Adapter. Also referred to as PPI (Programmable Peripheral Interface).
- **Pixel**
- One element of a digitized image, sometimes called picture element, or pel.
- **PLC**
- Programmable Logic Controller.
- **PLL**
- Phase Locked Loop.
- **Point To Point**
- A connection between only two items of equipment.
- **Polar Orbit**
- The path followed when the orbital plane includes the north and south poles.
- **Polarisation**
- The direction of an electric field radiated from an antenna.
- **Polling**
- A means of controlling I/O devices on a multipoint line in which CPU queries ('polls') the devices at regular intervals to check for data awaiting transfer (to the CPU). Slower and less efficient than interrupt driven I/O operations.
- **Polyethylene**
- A family of insulators derived from the polymerization of ethylene gas and characterized by outstanding electrical properties, including high IR, low dielectric constant, and low dielectric loss across the frequency spectrum.
- **Polyvinyl Chloride (PVC)**
- A general purpose family of insulations whose basic constituent is polyvinyl chloride or its copolymer with vinyl acetate. Plasticisers, stabilizers, pigments and fillers are added to improve mechanical and/or electrical properties of this material.
- **Port**
- A place of access to a device or network, used for input/output of digital and analog signals.

- **PPI**
- See PIA.
- **Presentation Layer**
- Layer 6 of the ISO/OSI Reference Model, concerned with negotiation of a suitable transfer syntax for use during an application. If this is different from the local syntax, the translation to/from this syntax.
- **Pretrigger**
- Boards with 'pretrigger' capability keep a continuous buffer filled with data, so when the trigger conditions are met, the sample includes the data leading up to the trigger condition.
- **Profibus**
- Process Field Bus developed by a consortium of mainly German companies with the aim of standardization.
- **Programmable Gain**
- Using an amplifier chip on an A/D board, the incoming analog signal is increased by the gain multiplication factor. For example, if the input signal is in the range of  $-250 \times 11\text{mV}$  to  $+250 \times 11\text{mV}$ , the voltage after the amplifier chip set to a gain of 10 would be  $-2.5 \times 11\text{V}$  to  $2.5 \times 11\text{V}$ .
- **PROM**
- Programmable Read Only Memory. This is programmed by the manufacturer as a fixed data or program which cannot easily be changed by the user.
- **Protocol Entity**
- The code that controls the operation of a protocol layer.
- **Protocol**
- A format set of conventions governing the formatting, control procedures and relative timing of message exchange between two communicating systems.
- **PSDN**
- Public Switched Data Network. Any switching data communications system, such as Telex and public telephone networks, which provides circuit switching to many customers.
- **PSTN**
- Public Switched Telephone Network. This is the term used to describe the (analog) public telephone network.
- **PTT**
- Post, Telephone and Telecommunications Authority.
- **Public Switched Network**
- Any switching communications system - such as Telex and public telephone networks - that provides circuit switching to many customers.
- **Pulse Input**
- A square wave input from a real world device such as a flow meter, which sends pulses proportional to the flow rate.



- **QAM**
- Quadrature Amplitude Modulation.
- **QPSK**
- Quadrature Phase Shift Keying.

- **Quagi**
- An antenna consisting of both full wavelength loops (quad) and Yagi elements.

# R

- **R/W**
- Read/Write.
- **RAM**
- Random Access Memory. Semiconductor read/write volatile memory. Data is lost if the power is turned off.
- **RAMDAC**
- Random Access Memory Digital-to-Analog Converter.
- **Range**
- The difference between the upper and lower limits of the measured value.
- **Range Select**
- The full-scale range a board uses is selected by one of three methods; through the DAS software, by a hardware jumper on the board, or through the use of an external reference voltage.
- **Raster**
- The pattern of lines traced by rectilinear scanning in display systems.
- **Reactance**
- The opposition offered to the flow of alternating current by inductance or capacitance of a component or circuit.
- **Real-time**
- A system is capable of operating in real-time when it is fast enough to react to the real-world events.
- **Reflectance Component**
- The amount of light reflected by an object in the scene being viewed.
- **Refresh Rate**
- The speed at which information is updated on a computer display (CRT).
- **Repeater**
- An amplifier which regenerates the signal and thus expands the network.
- **Resistance**
- The ratio of voltage to electrical current for a given circuit measured in ohms.
- **Resolution**
- The number of bits in which a digitized value will be stored. This represents the number of divisions into which the full-scale range will be divided; for example, a 010x11V range with a 12-bit resolution will have 4096x11(212)divisions of 2.44x11mV each (10x11V/212 or 10x11V/4096).
- **Response Time**
- The elapsed time between the generation of the last character of a message at a terminal and the receipt of the first character of the reply. It includes terminal delay and network delay.
- **RF**
- Radio Frequency.

- **RFI**
- Radio Frequency Interference.
  
- **RGB**
- Red/Green/Blue. An RGB signal has four separate elements; red/green/blue and sync. This results in a cleaner image than with composite signals due to the lower level of distortion and interference.
  
- **Ring**
- Network topology commonly used for interconnection of communities of digital devices distributed over a localized area, e.g. a factory or office block. Each device is connected to its nearest neighbors until all the devices are connected in a closed loop or ring. Data is transmitted in one direction only. As each message circulates around the ring, it is read by each device connected in the ring.
  
- **Ringing**
- An undesirable oscillation or pulsating current.
  
- **Rise Time**
- The time required for a waveform to reach a specified value from some smaller value.
  
- **RLE**
- Run Length Encoder. A digital image method whereby the first grey level of each sequential point-by-point sample and its position in the succession of grey levels is encoded. It is used where there is a tendency for long runs of repeated digitized grey levels to occur.
  
- **RMS**
- Root Mean Square.
  
- **ROI**
- Region of Interest.
  
- **ROM**
- Read Only Memory. Computer memory in which data can be routinely read but written to only once using special means when the ROM is manufactured. A ROM is used for storing data or programs on a permanent basis.
  
- **Router**
- A linking device between network segments which may differ in Layers 1, 2a and 2b of the ISO/OSI Reference Model.
  
- **RS**
- Recommended Standard, for example, RS-232C. More recent designations use EIA, for example, EIA-232C.
  
- **RS-232C**
- Interface between DTE and DCE, employing serial binary data exchange. Typical maximum specifications are 50\m11feet at 9200\m11baud.
  
- **RS-422**
- Interface between DTE and DCE, employing the electrical characteristics of balanced voltage interface circuits.
  
- **RS-423**
- Interface between DTE and DCE, employing the electrical characteristics of unbalanced voltage digital interface circuits.
  
- **RS-449**
- General purpose 37-pin and 9-pin interface for DCE and DTE employing serial binary interchange.
  
- **RS-485**
- The recommended standard of the EIA that specifies the electrical characteristics of drivers and receivers for use in balanced digital multipoint systems.

- **RTSI Bus**
- The Real-Time System Integration bus is an additional connector present on some DAS boards, allowing two or more of these boards to be connected together. It allows the boards to share data, timing and interrupt information at DMA transfer rates of up to 2.4 MB per second, leaving the PC bus free for other bus operations.
- **RTU**
- Remote Terminal Unit. Terminal Unit situated remotely from the main control system.

## S

- **S-Video**
- The luminance and chrominance elements of a video signal are isolated from each other, resulting in a far cleaner image with greater resolution.
- **SAA**
- Standards Association of Australia.
- **SAP**
- Service Access Point.
- **SDLC**
- Synchronous Data Link Control. IBM standard protocol superseding the bisynchronous standard.
- **Selectivity**
- A measure of the performance of a circuit in distinguishing the desired signal from those at other frequencies.
- **Self-calibrating**
- A self-calibrating board has an extremely stable on-board reference which is used to calibrate A/D and D/A circuits for higher accuracy.
- **Self-diagnostics**
- On-board diagnostic routine which tests most, if not all, of a board's functions at power-up or on request.
- **Serial Transmission**
- The most common transmission mode in which information bits are sent sequentially on a single data channel.
- **Session Layer**
- Layer 5 of the ISO/OSI Reference Model, concerned with the establishment of a logical connection between two application entities and with controlling the dialogue (message exchange) between them.
- **Shielding**
- The process of protecting an instrument or cable from external noise (or sometimes protecting the surrounding environment of the cable from signals within the cable).
- **Short Haul Modem**
- A signal converter which conditions a digital signal to ensure reliable transmission over DC continuous private line metallic circuits, without interfering with adjacent pairs of wires in the same telephone cables.
- **Shutter**
- A mechanical or electronic device used to control the amount of time a light-sensitive material is exposed to radiation.
- **SI**
- International metric system of units.

- **Sidebands**
- The frequency components which are generated when a carrier is frequency-modulated.
- **Sidereal Day**
- The period of an earth's rotation with respect to the stars.
- **Signal to Noise Ratio**
- The ratio of signal strength to the level of noise.
- **Signal Conditioning**
- Pre-processing of a signal to bring it up to an acceptable quality level for further processing by a more general purpose analog input system.
- **Simplex Transmission**
- Data transmission in one direction only.
- **Simultaneous Sampling**
- The ability to acquire and store multiple signals at exactly the same moment. Sample-to-sample inaccuracy is typically measured in nanoseconds. The PC-30DS board simultaneously samples 16 signals to within  $\pm 20 \times 11 \text{ ns}$ .
- **Single-ended**
- See number of channels.
- **Slew Rate**
- This is defined as the rate at which the voltage changes from one value to another.
- **Smart Sensors**
- A transducer (or sensor) with an on-board microprocessor to pre-process input signals to the transducer. It also has the capability of communicating digitally back to a central control station.
- **SNA**
- Systems Network Architecture.
- **SNR**
- Signal to Noise Ratio.
- **Software Drivers**
- Typically a set of programs or subroutines allowing the user to control basic board functions, such as setup and data acquisition. These can be incorporated into user-written programs to create a simple but functional DAS system. Many boards come with drivers supplied.
- **Software Trigger**
- Software control of data acquisition triggering. Most boards are designed for software control.
- **SOH**
- Start of Header (ASCII Control-A).
- **Space**
- Absence of signal. This is equivalent to a binary zero.
- **Spark Test**
- A test designed to locate imperfections (usually pin-holes) in the insulation of a wire or cable by application of a voltage for a very short period of time while the wire is being drawn through the electrode field.
- **Spatial Resolution**
- A measure of the level of detail a vision system can display. The value, expressed in mils or inches per pixel, is derived by dividing the linear dimensions of the field of view (x and y, as measured in the image plane), by the number of pixels in the x and y dimensions of the system's imaging array or image digitizer.

- **Spatial Filtering**
- In image processing, the enhancement of an image by increasing or decreasing its spatial frequencies.
- **Spectral Purity**
- The relative quality of a signal measured by the absence of harmonics.
- **Speed/Typical Throughput**
- The maximum rate at which the board can sample and convert incoming samples. The typical throughput is divided by the number of channels being sampled to arrive at the samples/second on each channel. To avoid false readings, the samples per second on each channel need to be greater than twice the frequency of the analog signal being measured.
- **Standing Wave Ratio**
- The ratio of the maximum to minimum voltage (or current) on a transmission line at least a quarter-wavelength long. (VSWR refers to voltage standing wave ratio).
- **Star**
- A type of network topology in which there is a central node that performs all switching (and hence routing) functions.
- **Statistical Multiplexer**
- Multiplexer in which data loading from multiple devices occurs randomly throughout time, in contrast to standard multiplexers where data loading occurs at regular predictable intervals.
- **STP**
- Shielded Twisted Pair.
- **Straight Through Pinning**
- EIA-232 and EIA-422 configuration that match DTE to DCE, pin for pin (pin 1 with pin1, pin 2 with pin 2, etc).
- **Strobe**
- A handshaking line used to signal to a receiving device that there is data to be read.
- **STX**
- Start of Text (ASCII Control-B).
- **Subharmonic**
- A frequency that is an integral submultiple of a reference frequency.
- **Switched Line**
- A communication link for which the physical path may vary with each use, such as the public telephone network.
- **Sync**
- A synchronization or sync, pulse ensures that the monitor displaying the information is synchronized at regular intervals with the device supplying the data, thus displaying the data at the right location. For example, a sync pulse would be used between a camera and a display device to reset the image to the top of the frame for the beginning of the image.
- **Synchronisation**
- The co-ordination of the activities of several circuit elements.
- **Synchronous Transmission**
- Transmission in which data bits are sent at a fixed rate, with the transmitter and receiver synchronized. Synchronized transmission eliminates the need for start and stop bits.

# T

- **Talker**
- A device on the GPIB bus that simply sends information onto the bus without actually controlling the bus.
- **Tank**
- A circuit comprising inductance and capacitance which can store electrical energy over a finite band of frequencies.
- **TCP/IP**
- Transmission Control Protocol/Internet Protocol. The collective term for the suite of layered protocols that ensures reliable data transmission in an internet (a network of packet switching networks functioning as a single large network). Originally developed by the U.S. Department of Defense in an effort to create a network that could withstand an enemy attack.
- **TDM**
- Time Division Multiplexer. A device that accepts multiple channels on a single transmission line by connecting terminals, one at a time, at regular intervals, interleaving bits (bit TDM) or characters (Character TDM) from each terminal.
- **TDR**
- Time Domain Reflectometer. This testing device enables the reflections user to determine cable quality with providing information and distance to cable defects.
- **Temperature Rating**
- The maximum and minimum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.
- **Text Mode**
- Signals from the hardware to the display device are only interpreted as text characters, leading to a maximum resolution defined by the number of characters across a screen by the number of vertical lines. Text mode can be faster than graphics mode but the resolution and the type of graphics that can be displayed are limited by the text character set.
- **Thresholding**
- The process of defining a specific intensity level for determining which of two values will be assigned to each pixel in binary processing. If the pixel's brightness is above the threshold level, it will appear in white in the image; if it is below the threshold level, it will appear in black.
- **TIA**
- Telecommunications Industry Association.
- **Time Division**
- The process of transmitting multiple signals over a single channel by Multiplexing taking samples of each signal in a repetitive time sequenced fashion.
- **Time Sharing**
- A method of computer operation that allows several interactive terminals to use one computer.
- **Time Domain**
- The display of electrical quantities versus time.
- **Token Ring**
- collision free, deterministic bus access method as per IEEE 802.2 ring topology.
- **TOP**



- Technical Office Protocol. A user association in USA which is primarily concerned with open communications in offices.
- **Topology**
  - Physical configuration of network nodes, e.g. bus, ring, star, tree.
- **Transceiver**
  - A combination of transmitter and receiver.
- **Transducer**
  - Any device that generates an electrical signal from real-world physical measurements. Examples are LVDT's, strain gauges, thermocouples and RTDs. A generic term for sensors and their supporting circuitry.
- **Transient**
  - An abrupt change in voltage of short duration.
- **Transmission Line**
  - One or more conductors used to convey electrical energy from one point to another.
- **Transport Layer**
  - Layer 4 of the ISO/OSI Reference Model, concerned with providing a network independent reliable message interchange service to the application oriented layers (layers 5 through 7).
- **Trigger**
  - A rising edge at an 8254 timer/counter's gate input.
- **Trunk**
  - A single circuit between two points, both of which are switching centers or individual distribution points. A trunk usually handles many channels simultaneously.
- **Twisted Pair**
  - A data transmission medium, consisting of two insulated copper wires twisted together. This improves its immunity to interference from nearby electrical sources that may corrupt the transmitted signal.

# U

- **UART**
  - Universal Asynchronous Receiver/Transmitter. An electronic circuit that translates the data format between a parallel representation, within a computer, and the serial method of transmitting data over a communications line.
- **UHF**
  - Ultra High Frequency.
- **Unbalanced Circuit**
  - A transmission line in which voltages on the two conductors are unequal with respect to ground e.g. a coaxial cable.
- **Unipolar Inputs**
  - When set to accept a unipolar signal, the channel detects and converts only positive voltages. (Examples: 0 to +10V).
- **Unloaded Line**
  - A line with no loaded coils that reduce line loss at audio frequencies.

- **Upconverter**
- A device used to translate a modulated signal to a higher band of frequencies.
- **Uplink**
- The path from an earth station to a satellite.
- **USRT**
- Universal Synchronous Receiver/Transmitter. See UART.
- **UTP**
- Unshielded Twisted Pair.

## V

- **V.35**
- CCITT standard governing the transmission at 48 kbps over 60 to 108 kHz group band circuits.
- **VCO**
- Voltage controlled oscillator. Uses variable DC applied to tuning diodes to change their junction capacitances. This results in the output frequency being dependant on the input voltage.
- **Velocity of Propagation**
- The speed of an electrical signal down a length of cable compared to speed in free space expressed as a percentage.
- **VFD**
- Virtual Field Device - a software image of a field device describing the objects supplied by it e.g. \x11 measured data, events, status etc., which can be accessed by another network.
- **VGA**
- Video Graphics Array. This standard utilizes analog signals only (between 0 and 1\x11V) offering a resolution of 640 by 480 pixels, a palette of 256 colors out of 256000 colors and the ability to display 16 colors at the same time.
- **VHF**
- Very High Frequency.
- **Vidicon**
- A small television tube originally developed for closed-circuit television. It is about one inch (2.54\x11cm) in diameter and five inches (12.7\x11cm) long. Its controls are relatively simple and can be operated by unskilled personnel. The Vidicon is widely used in broadcast service.
- **Volatile Memory**
- A storage medium that loses all data when power is removed.
- **Voltage Rating**
- The highest voltage that may be continuously applied to a wire in conformance with standards of specifications.
- **VRAM**
- Volatile Random Access Memory. See RAM.
- **VSD**
- Variable Speed Drive.

- **VT**
- Virtual Terminal.

## W

- **WAN**
- Wide Area Network.
- **Waveguide**
- A hollow conducting tube used to convey microwave energy.
- **Wedge Filter**
- An optical filter so constructed that the density increases progressively from one end to the other, or angularly around a circular disk.
- **Word**
- The standard number of bits that a processor or memory manipulates at one time. Typically, a word has 16 bits.

## X

- **X.21**
- CCITT standard governing interface between DTE and DCE devices for synchronous operation on public data networks.
- **X.25 Pad**
- A device that permits communication between non X.25 devices and the devices in an X.25 network.
- **X.25**
- CCITT standard governing interface between DTE and DCE device for terminals operating in the packet mode on public data networks.
- **X.3/X.28/X.29**
- A set of internationally agreed standard protocols defined to allow a character oriented device, such as a visual display terminal, to be connected to a packet switched data network.
- **X-ON/X-OFF**
- Control characters used for flow control, instructing a terminal to start transmission (X-ON) and end transmission (X-OFF).