# Glossary

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| **10Base2** | An Ethernet wiring standard that uses thin coaxial cable as the network medium. A maximum of 185 metres (616 ft) is possible per network segment. Devices can be connected directly onto the LAN by daisy-chaining. |
| **10Base5** | An Ethernet wiring standard that uses thick, double shielded coaxial cable as the network medium. A maximum of 500 metres (1666 ft) is possible per network segment. A MAU is attached into the cable to enable devices to communicate via an AUI port located on the Ethernet device. |
| **10BaseFL** | An Ethernet wiring standard that uses fibre optic cable as the network medium. 10BaseFL runs at 10 Mbit/s. |
| **10BaseT** | An Ethernet wiring standard that uses two twisted pairs of copper wire as the network medium. A maximum distance of 100 metres (328 ft) is allowed between devices or to a network hub or switch. An RJ-45 style connector is used as the connection on Ethernet Devices. 10BaseT runs at 10 Mbit/s while 100BaseT runs at 100 Mbit/s. |
| **AC** | **A**lternating **C**urrent |
| **Amplitude modulation** | The transfer of information through varying the signal strength, amplitude, of the carrier wave. |
| **ARP** | The **A**ddress **R**esolution **P**rotocol is used to map IP addresses to MAC addresses. As a TCP/IP tool, it's used to add or delete MAC or IP addressing information. |
| **ARQ** | **A**utomatic **R**epeat re**Q**uest. |
| **ASCII** | A code system for binary data code that defines 128 codes with the help of different combinations of ones and zeros. ASCII = **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange |
| **Asynchronous** | Data is sent one character at a time with start and stop bits. Approximately 90–95% of all serial data communications are asynchronous. |
| **Attenuation** | The data signals strength is reduced by the length of the cable and the number of splices (fibre). |
| **AUI** | The **A**ttachment **U**nit **I**nterface Port. A standard 15 Pin D-type Ethernet cable used to connect between a network device and an MAU. |

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| **Auto-Negotiate** | The IEEE802.3u standard specifies a MAC sub-layer for the identification of the speed and duplex mode of connection being supported by a device. Support of this feature is optional. |
| **Auto-Sense** | The ability of a 10/100 Ethernet device to interpret the speed and duplex mode of the attached device. It will automatically configure itself to match the required configuration. |
| **Baud** | Defines the speed of the number of "packets" transferred per second. With local data communication baud = bit/s. With telecommunication there can be more bits in each packet. |
| **Binary** | Digits can only adopt one of two values, one or zero, which are represented by the computer semiconductor's two possible positions, the absence and presence of a current. |
| **Bit** | A data bit is a binary digit, a one or a zero. |
| **Bit/s** | The transfer of data measured in the number of data bits per second. |
| **BOOTP** | The BOOTP Protocol allows network devices to request configuration information from a BOOTP server. |
| **BRI** | Basic Rate Interface, ISDN service that gives access to two B-channels and one 16 kbit/s D-channel. |
| **Broadband** | A technology that makes it possible to simultaneously transfer several different channels with data, audio and video at different frequencies. |
| **BSC** | Base Station Controller, A switching station in a GSM network that communicates between the base transceiver stations and the core network. |
| **BTS** | Base Transceiver Station, Base radio station in the GSM network that communicates between mobile equipment and a BSC (Base Controller Station). |
| **Buffer** | Memory storage that can save data for short periods, for example, while waiting for the receiver. |
| **Byte** | Is a character built up of binary digits, for example, an ASCII-character, that consists of 7–8 data bits, which corresponds to an alphanumerical character. |

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| **Capacitance** | Ability to absorb an electrical charge.<br>Measured in  microfarad  $= 10^{-6}$    F = 1 µF<br>$\qquad\qquad\quad$ nanofarad  $= 10^{-9}$    F = 1 nF<br>$\qquad\qquad\quad$ picofarad  $= 10^{-12}$   F = 1 pF |
| **CAT5** | A copper twisted pair cable that supports bandwith up to 100 MHz or 1000 MHz when using all four pairs. Common data rates are 100 Mbit/s or 1000 Mbit/s. |
| **CAT5e** | Enhanced Cat 5 standard provides noice immunity. This is the most common in new installations. |
| **CHAP** | The **C**hallenge **H**andshake **A**uthentication **P**rotocol is far more secure than PAP. Along with requesting password information during log-on, passwords are requested during challenge mode. Failure to provide an identical character or password will terminate the connection. |
| **Checksum** | Result of a mathematical function that controls whether the data transfer is correct. |
| **Client Server** | A LAN solution where data processing and software are shared between personal computers (clients) and a server. |
| **Clock** | A regular frequency sent from a signal source (clock pulse generator) which, among others, is used to set speed rates, for example, of the data flow with serial transfer. |
| **CMV** | **C**ommon **M**ode **V**oltage, longitudinal voltage, usually inductively generated. |
| **Coaxial cable** | A cable with a screened outer casing and protected conductor for fast and interference insensitive data transfer. |
| **Collision** | The result when two or more devices try to transmit data on the same network at the same time. The data when this occurs is corrupted. |
| **CSD** | **C**ircuit **S**witched **D**ata, The most common form to transfer data via the GSM network. |
| **CSMA/CD** | **C**arrier **S**ense **M**ultiple **A**ccess/**C**ollision **D**etect. This is the Ethernet media access method where all devices equally contend for access to the network to transmit data. If a device detects another device's signal whilst attempting to transmit, the transmission is aborted and a retry is attempted after a delay. |
| **Current Loop** | A current loop is a serial transfer method that converts between absence and presence of a current on a wire pair. |

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| **Data bits** | See bit. |
| **Databus** | Several parallel cables for the transfer of data internally in equipment. |
| **Datagram** | A self-contained sequence of data that carries sufficient information so that it can be routed from source to destination without any other or earlier type of interaction between these two devices. This type of connection is commonly referred to as connectionless based communication. |
| **DC** | Direct Current. |
| **DCE** | Data Communication Equipment. |
| **DDS1** | European standard for ISDN connections. |
| **Dedicated line** | Privately own communication cable. |
| **DHCP** | The Dynamic Host Configuration Protocol enables devices to request and then be assigned IP addresses from a DHCP Server located on the LAN. If a DHCP server is not available IP addresses have to be statically fixed into the configuration of the Ethernet Device. |
| **Dial-up network** | Another way of referring to the public-switched telephone network (PSTN). |
| **DIN rail** | Deutsche Industri Norme, standard for mounting equipment in cubicles. |
| **DTE** | Data Terminal Equipment. |
| **Duplex** | Defines communication in both directions. In half duplex the parties take turns to send and receive, in full duplex it occurs simultaneously. |
| **EMC** | Electro Magnetic Compatibility, design of products so that they do not interfere with other electronic equipment. |
| **EMI** | Electro Magnetic Interference. |
| **Ethernet** | Is one of the common standards for LAN-bus networks within office applications and can be built with both coaxial cable and special 4-wire cable. |
| **Euro-ISDN** | Realization of ISDN based on European standards. |
| **Fading** | The signals are weakened or attenuated with the transfer distance (cable, air, etc) |

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| **Faxmodem** | A modem that can send and receive data information (text, images) in fax format. |
| **FDDI** | **F**ibre **D**istributed **D**ata **I**nterface: A standard for fibre-optic networks. |
| **Fibre optics** | Modulated laser light or laser beams from light emitting diodes through thin glass or plastic fibre, normally between 800–1300 nm (nanometre). Bunches of fibre cable can transfer vast amounts of information. |
| **Fieldbus** | A defined standard for industrial data networks, for example, PROFIBUS. |
| **Firewall** | A router used to screen IP addresses. |
| **Four wire** | Twisted pair 4-wire cable. |
| **FP** | A **F**ibre Optic Ethernet **P**ort. |
| **Frame** | A **Frame** is data that is sent between two Ethernet devices as a complete unit with addressing and protocol control information. The information is passed serially bit-by-bit. |
| **Frequency modulation** | Technology to transfer information by varying the frequency of the carrier wave. |
| **FRNT** | **F**ast **R**e-Configuration **N**etwork **T**opology. Ethernet switches are placed into multiple redundant rings. Enhanced redundancy is provided by linking separate rings with backup paths. |
| **FTP** | **F**ile **T**ransfer **P**rotocol. This is the one of the simplest ways of transferring files across the internet. It uses the TCP/IP protocols to enable file transfer. |
| **Full duplex** | Bi-directional communication where signals can flow in both directions simultaneously. |
| **Galvanic isolation** | Means electrical isolation, i.e. no electrical contact. |
| **GPRS** | **G**eneral **P**acket **R**adio **S**ervice. A service offered in GSM to handle packet switching data traffic. |
| **GPRS Attach** | An inquiry from GSM equipment concerning permission to connect to a GPRS network. |
| **GPS** | **G**lobal **P**osition **S**ystem. A satellite navigation system based on 24 satellites orbiting the world. Each satellite contains an atomic clock accurate to within a billionth of a second. |

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| **Ground currents** | Current that flows in the ground conductors between two systems with different ground potential. |
| **GSM** | **G**lobal **S**ystem for **M**obile communication, a standard for digital wireless communication. |
| **Half duplex** | Two way communication. |
| **Handover** | Name for switching between base transceiver stations when communicating via the GSM network. |
| **Handshaking** | Confirmation and status signals sent between communicating equipment to check the data flow. |
| **Hayes commands** | A group of commands for communications with telephone modems. |
| **Hub** | A simple device that enables network segments to be connected. When a packet is received on one port it is sent to all ports on the Hub. |
| **IEEE802.1d** | Spanning Tree Protocol standard. A basic method of providing network redundancy. |
| **IEEE802.1p** | Packet prioritization standard. A method of prioritizing packets by adding a priority tag to the packet. This enables the packet to override low priority traffic. |
| **IEEE802.3** | The standard specification for Ethernet. |
| **IEEE802.3x** | A standard for Ethernet flow control. A way to throttle the speed of a switch if the buffer is about to overflow. A packet is sent that requests the sending switch to pause sending packets for a period of time. |
| **Interface** | A defined standard for signals, electrical levels and inter-connection. |
| **Interface Converter** | Modem that converts signals between two different interfaces, for example, between RS-232 and RS-422/485. |
| **IP** | The IP (**I**nternet **P**rotocol) is responsible for moving packets of data from node to node without any regard for the content. IP forwards each packet based on a four byte destination address (the IP address). |

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| **IP Address** | The IP address is a 32-bit number that identifies a network device. The IP address is made up of two parts. Firstly, the identifier of a particular network and secondly an identifier of the particular device on that network. Due to the finite number of IP addresses with a 32-bit number a new IPv6 address method is now being implemented. |
| **ISDN** | Integrated Services Digital Network, standard concerning digital networks for telecommunication, data, fax, video and video telephony. |
| **Isolator** | Provides galvanic isolation between communicating units. |
| **ISP** | Internet Service. Provider. A company that provides a link to the Internet. |
| **LAN** | A Local Area Network is a group of computers or Ethernet devices that share a common communications structure. LANs can range in size from a couple of devices to many hundreds. |
| **LAPM** | Link Access Procedure for Modems, a method for error correction when transferring via telephone modems. |
| **LCD** | Liquid Crystal Display, display made up of liquid crystals. |
| **Leased line** | A 2-/4-wire connection rented from a telephone company. It can either be a point to point or a multidrop connection. |
| **LED** | Light Emitting Diode, semiconductor that transmits light when exposed to an electric current. |
| **Line sharer** | Divides a single data line into several, for example, when two or more computer users need to share common equipment. |
| **Local modem** | See short-haul modem. |
| **M2M** | Machine-to-Machine, abbreviation of "Machine to machine communication". |
| **MAC Address** | The Media Access Control address in the unique hardware number that is assigned to the Ethernet Device during manufacture. Normally, the MAC address cannot be altered. |
| **MAN** | Metropolitan Area Networks. Name for networks shared by several interested parties, usually within the same town or area. |
| **Manchester coding** | A modulation method that simplifies the locking of the symbol clock. |
| **Master** | Main device that polls slaves in a polled system. |

**MAU**          **M**edia **A**ttachment **U**nit. Enables a device to tap into the LAN Medium. Commonly the LAN medium used with this type of interface is coaxial cable. This type of cable is referred to as to as Thicknet or Thinnet.

**MDI**          **M**edium **D**ependant **I**nterface. An Ethernet port that allows connection to other Data Communication Equipments (Switches, Hubs etc) without the need of a null modem coaxial cable or cross over cable. These can be referred to as uplink ports.

**MDI/MDI-X auto**     An Ethernet port that detects whether the end port is a MDI or MDI-X device and automatically configures the port accordingly.

**MDI-X**         **M**edium **D**ependant **I**nterface – **C**rossover. An Ethernet port that allows connection to other Data Terminal Equipment (PCs, PLCs etc).

**MIB**          **M**anagement **I**nformation **B**ase. A database of objects that can be polled or interrogated by a management system using SNMP.

**MNP**          **M**icrocom **N**etworking **P**rotocol, several methods for error correction and compression of data for telephone modems.

**Modem**         Composite word of **mo**dulator and **dem**odulator. A modem modulates or converts the signal from computer equipment into electrical signals for transmission. At the receiver there is a corresponding modem that coverts the signals back again, demodulates.

**MSC**          **M**obile **S**witching **C**enter, switching station in a GSM network to external networks for example, ISDN and PSTN

**Multidrop**      One of the most common topologies for industrial data networks.

**Multimode**     Technology for fibre-optic transfer where light waves are reflected in the fibre core.

**Multiplexer**    Also known as a wire saver, as it replaces 2 or more leased lines with modems and one line by establishing independent channels.

**NMT**          **N**ordic **M**obile **T**elephony, earlier analogue mobile telephone network.

**NTP**          **N**etwork **T**ime **P**rotocol. An Internet standard that assures high accuracy time synchronization to the millisecond of clocks located in Ethernet devices. The protocol is based on TCP/IP.

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| **Network** | General designation of communication links between two or more pieces of equipment. |
| **OPC** | **O**pen **P**rocess **C**ontrol. (Formally OLE Process Control). An open standard that enables devices to openly communicate with each other regardless of manufacturer. |
| **Optocoupler** | Signal transmission via light, for example, light emitting diodes and photo-transistors. An optocoupler does not conduct electrical current and in thus provides galvanic isolation. |
| **Optoplexor** | Multiplexer for fibre cable. See multiplexer. |
| **OSI** | **O**pen **S**ystem **I**nterconnection, a reference model for the definition of how data is handled in different communication layers when transferring. |
| **Packet** | This is the unit of data that is passed between a source and destination device on the Internet. When data is requested from a device the TCP layer of TCP/IP divides the file into chunks. Using TCP/IP each of these packets is numbered and although routed via different paths enables the packets to be correctly re-assembled at the destination device. Packet sizes range from 48 Bytes to 1518 Bytes (1522 Bytes if Priority Tagging is implemented). |
| **PAP** | The **P**assword **A**uthentication **P**rocedure. A password is sent as clear text to the server for comparison. |
| **Parallel transfer** | Simultaneous transfer of data bits on each line. An 8-bit character (=1 byte) requires 8 parallel lines. 32-bit communication transfers 4 bytes simultaneously on 32 parallel lines. Parallel transfer primarily takes place internally in data equipment and over very short distances. |
| **Parity bit** | Mathematically calculated control bit that the transmitting equipment adds. The receiving unit controls the parity and any errors in the transfer are detected. |
| **PDP Context** | **P**acket **D**ata **P**rotocol. PDP Context is information that defines a GPRS connection between an MS (**M**obile **S**tation) and a GPRS network. Context defines aspects such as routing, QoS (**Q**uality **o**f **S**ervice.), security, tariffs, etc. |
| **PDS** | **P**remises **D**istributed **S**ystem. Refers to different levels of integrated systems for data communication, telecommunication, heating, ventilation, monitoring, etc. |

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| **Phase Modulation** | Affects the signals position during the period, phase angle, to encode data bits. Phase modulation is primarily used in digital transmisions. |
| **Pin** | Terminal in e.g. a D-sub connector and on circuits intended for mounting/ soldering. |
| **PLC** | Programmable Logic Controller. |
| **Polling** | Connected units are asked, polled, by the main computer whether they have information to send. |
| **POTS** | Plain Old Telephone System, same as PSTN |
| **PPP** | Point to Point Protocol. A communication protocol enabling a PC to connect and communicate to an additional Ethernet connection via a serial link. |
| **PRI** | Primary Rate Interface, ISDN-service that provides access to one 64 kbit/s D-channel and 30 B-channels (In Europe). |
| **Priority Tagging** | The ability of an Ethernet network device to set a flag within an Ethernet packet that enables it to have higher priority than other packets on the same network. |
| **PROFIBUS** | Standard for industrial data network. |
| **Protocol** | Establishes regulations for data communications, how the signals are interrelated, how they are sent, received, started and stopped and how queues are handled, etc. |
| **PSTN** | Public Switched Telephone Network, the common analogue telephone system. |
| **PTT-modem** | A modem for data communication via the Public Telephone Network. |
| **QoS** | Quality of Service. A definable service and quality level on network services, for example, echo, noise, bit error frequency, connection times, etc. |
| **Rack modem** | For mounting in a 19" rack. |
| **Remote** | Possibility, via some communication media (GSM, ISDN, line) |
| **Connection** | to connect to off-site equipment. |
| **Repeater** | Signal amplifier that recreates signals and allows new segments to be added to the network. |
| **Resistance** | The electrical resistance of the cable per kilometre. |

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| **Ring network** | A series connected network where all units are connected in a closed ring and all communications pass through all units. |
| **RJ-45** | 8-pos. modular connector according to ISO standard 8877. |
| **RLP** | Radio Link Protocol. Error correction protocol used in GSM. |
| **RMON** | Remote Monitoring. Is a standard MIB that provides diagnostic data for networks. |
| **Roaming** | Possibility to use GSM equipment on several different operators' network. |
| **Router** | A Router is a device (normally a PC) that is connected to at least two networks and determines the next network point that a packet should be sent to. Typically, a packet may be sent via a number of routers before arriving at the correct destination. More complex routers have look-up tables that enable them to determine the quickest or most cost effective route to send the packet. |
| **RS-232** | American standard, serial communication. |
| **Segment** | Delimited part of a network. |
| **Serial transfer** | Signifies that data characters are sent one by one on a single line, unlike parallel transfer. |
| **Short-haul modems** | Modulates the signal and adapts it for different cables and interfaces. The modem gives secure transfer over long distances. A short-range modem or local modem is used in local data communications. |
| **Short-range modem** | Modulates the signal and adapts it for different cables and interfaces. The modem gives secure transfer over long distances. A short-range modem or local modem is used in local data communications. |
| **Simplex** | One way communication. |
| **Singlemode** | Technology for the transfer of optical signals in fibre cable. Singlemode is usually used in laser transfer in very thin fibre cores. |
| **Slave** | Device that is polled in a polled system. |
| **SMS** | Short Message Service, a service to send/receive short text messages via the GSM network. |

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| **Star network** | A network built from a central unit, with direct lines to the connected units. |
| **Start bit** | Denotes the beginning of data transfer. With asynchronous transfer each character is preceded by a start bit. |
| **Status signal** | Reports the status of the connected equipment, for example, switched on, ready to receive, ready to send. |
| **Stop bit** | One or more stop bits denote that the character is finished. |
| **Switch** | Switch, manually or software controlled that redirects the data traffic. |
| **Synchronous** | Transfer, characters are sent and received in a single sequence at a constant rate. The rate is controlled by clock signals. |
| **TCP** | **T**ransmission **C**ontrol **P**rotocol is responsible for delivering and verifying data from device to device. The protocol detects errors or lost data and can also trigger a re-transmission until the data is correctly and completely received. |
| **TCP/IP** | **T**ransmission and **C**ontrol **P**rotocol/**I**nternet **P**rotocol, developed for the Internet, to interconnect several LANs in a WAN to permit the exchange of data irrespective of the source, with the help of, among others, a routing protocol. TCP/IP, which initially was UNIX-based, is making ground as a network protocol even in other environments. |
| **TDM** | **T**ime **D**ivision **M**ultiplexing, where the channel is divided into time slots which are allocated different sub-channels. See multiplexer. |
| **Telephone modem** | Modem for communications via the telephone network. |
| **Terminal** | Subordinate unit without its own computing capacity to a main computer or mainframe. Also a personal computer with its own capacity can act as a terminal in some applications. |
| **TFTP** | **T**rivial **F**ile **T**ransfer **P**rotocol. A further simple way to transfer files. This protocol uses UDP/IP protocol to enable file transfer. |
| **Topology** | Network configuration. |
| **TP** | A Copper **T**wisted **P**air Port. |
| **Transients** | High current peaks, changes and distrurbances on the network. |

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| **UDP** | User Datagram Protocol is responsible for delivering data from one device to another. UDP usually uses IP to pass data but unlike TCP does not enable the message to be broken down into packets that can be correctly re-assembled at the destination. Therefore, the application using UDP must have the ability to detect that the message or data has been correctly received. However, UDP has an advantage of passing data faster and with less overhead when compared with TCP. UDP is ideal for applications where small amounts of data are to be passed quickly. |
| **Unintelligent equipment** | Cannot save data about itself, for example, its own address on a network. Examples of unintelligent equipment are basic I/O-devices, transducers, sensors, measurement instruments, etc. |
| **Unix** | Multi-user system for mainframes and minicomputers that can manage many processes simultaneously. |
| **V.24** | American standard, serial communication. |
| **WAN** | A Wide Area Network is a geographically dispersed communications network. |
| **Watchdog** | A monitoring circuit for supervision and automatic resetting of modem functions. |
| **VN4** | French standard for ISDN connections. |