Glossary A

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AC

Alternating Current. Refers to a situation where current flows back and forth through a conductor (wire) in alternating directions. Generally, the voltage being applied to the conductor has a changing (alternating) polarity so the current has to change direction related to which end of the wire is positive or negative at a given point of time. In most cases we encounter, the voltage moves in a sinusoidal wave shape centered at zero volts, though it could be centered at another point. If it is centered at another point than zero volts, it is most often referred to as having a voltage offset. An AC voltage could have another wave shape besides sinusoidal depending on the application or components it is reacting with. The rate at which it changes direction is referred to as its frequency.

The opposite of AC is DC where the current only flows in one direction. DC will have a voltage level in only one direction, either positive or negative, referenced to a common, ground or zero volts reference point.

Mains power in many countries such as Britain, Australia and Europe is at 230v AC at a frequency of 50Hz, that is 50 complete cycles per second. North America uses 115v at 60Hz.
http://www.allaboutcircuits.com/vol_2/chpt_1/1.html

Accessory decoders

DCC decoders are used to control trackside accessories such as turnouts and signals using the NMRA standard pulsed signal. The accessory decoder is controlled similar to a train decoder using a unique decoder address and a series of function variables. The signal can be carried by the track and track feeders or can be a separate circuit, which avoids the risk of a derailment or short preventing the control of the turnouts. All DCC manufacturers make accessory decoders and MERG provide kits.
https://www.merg.org.uk/merg_resources/dcc.php

Accessory encoder

The MERG DCC accessory encoder is designed to operate as a DCC command station independently from the track DCC. It uses the NMRA Standard for its information encoding and can operate most other accessory decoders as well as the MERG kits.
https://www.merg.org.uk/merg_resources/dcc.php

Address

Address is the unique identification of anything. In the context of DCC it means the coding of each loco or other decoder, which ensures that it identifies the signals intended for it.

You will encounter two address ranges in the NMRI DCC standard, two-digit addressing (called short addressing) and four-digit addressing (called long or extended addressing). The number of digits refers to how many hexadecimal digits are transmitted/received for a decoder address from the DCC system. A two-digit address can have hex numbers between 01 and FF (1 to 127 decimal). A four-digit address can have from 0001 to 27FF (1 to 10239 decimal). Many model railroad users use four-digit addressing in order to match up the DCC address with the four-digit train engine number to make it easy to remember the number to control the engine. So, if the engine number is 1234, the train decoder will be set to 1234 as well. Generally address 00 is reserved in each number system for analogue operation and is also known as the Broadcast Address.

DCC decoders store the addresses in Configuration Variables (CVs). Each decoder vendor may have different set of CVs to store the digits. Refer to the docs that came with your decoder.

Agile

Agile is a Manifesto for Software Development. It aims to deliver working software quickly. See the Agile Manifesto and its history

Amplifier

An Amplifier is a device or circuit that converts a small signal, voltage or current, into a larger signal, voltage or current. Amplifiers are typically built from discrete devices like tubes or transistors, or are manufactured as a IC device to reduce components or complexity.

You will generally run into three amplifier types on the MERG forum or with MERG kits; a transistor as an amplifier, an Operational Amplifier (op amp) such as an LM324 or an audio amplifier such as an LM386.

AM

Amplitude Modulation. The process of additively mixing a single or number of frequencies with the carrier wave to produce a complex waveform with variable amplitude. This signal may be demodulated by a simple diode detector. Most common method for low, medium and high frequency broadcast transmissions.

Amps or Ampere

An ampere is a measure of current flow. It is roughly defined as 6.28 X 10^18 electrons passing a point in one second. From a formula perspective one amp equals one volt divided by one ohm. If you had a one volt battery connected across a one ohm resistor, you would expect to measure one amp of current flow around the circuit. Current values are often shown in formulas and on datasheets with

the letters “A”, mA or uA. In formulas current is generally shown as the letter “I”. For example E = I x R. The letter “I” would most often be a value in amps, milliamps or microamps.

In the model railroad context, you would expect to see a DC supply or a DCC booster providing several amps of current to a track, and most other circuits or LED signals using ones to hundreds of milliamps.

In a home environment, you would expect to see outlets in the 13 amp to 20 amp range and mains breaker panels working in the 50 amp to 200 amp range.

Analogue

A continuously variable signal. This is generally compared to a digital signal, which increases in steps or is conveyed by digital coding.

AND

This is a Boolean operator which is used to join two statements so that the final statement is true only if the individual statements are all true. Thus (X>1)AND(X<2) is true if X is between 1 and 2. In electronic logic circuits an AND circuit is shown here.

API

Application Program Interface - A set of routines / protocols and tools for building software applications.
API

Arduino

A collection of single-board microcontrollers that are programmed with an easy to use development environment. Arduinos are used to create a wide range of electronic applications. It is popular in model railways for controlling level crossing lights and barriers, signals, points, control panels and much more.
Arduino

ASCII

American Standard Code for Information Interchange Table of Codes
ASCII

Aspect

The name given to the appearance of a signal to the driver of a train. Each aspect is allocated a specific meaning so that the driver can decode the message and react accordingly. For example a semaphore home signal has two aspects, one with the arm horizontal meaning stop and one with the arm inclined meaning proceed.

AT-Bus

An alternative CAN Bus protocol devised by MERG member Roger Edwards which overcomes what he sees as deficiencies in the CBUS protocol.

ATC

Stands for Automatic Train Control. Within MERG usually refers to a series of kits for automating train running on DC layouts. These kits are capable of controlling layouts from a simple end to end shuttle up to quite complex arrangements. The abbreviation may also be found as a more general reference to automatic train control, model or prototype.
A brief description of an exhibition demo may be found here.

Auto Reverse Module

An auto reverse module is used in DCC to prevent shorts in reversing loops and other situations where the polarity of two lines must be reversed for a train to run through. It works by reversing the polarity if a short is detected. If the short is eliminated then the new polarity is accepted and is kept. One auto reverse module can protect several track sections provided that only one section break is being bridged by a loco at any one time.

AVR

AVR is the name of a microcontroller family used in many Arduino boards. See AVR microcontrollers.

AWD

Audible Warning Device - Typically a Piezo-disc as its low power. But use a klaxon if you want the whole room to know there is a problem.

AWG

American Wire Gauge is a set of standard sizes for wire diameter. It covers both solid and stranded wire.

As the gauge number gets larger the wire diameter gets smaller. Larger wire is generally used for carrying higher current levels since larger wire has less resistance and so for higher currents less voltage is dropped over a given distance.

In North America, extension cords are generally wired with 16AWG or 14AWG. House outlet wiring would generally have 14AWG or 12AWG wiring. In the UK, Australia and many other countries 2.5mm or 4mm wiring would be used in a similar fashion. Bus wires for DC or DCC may use large gauges such as these to supply a fairly constant voltage level (provides a low voltage drop over distance) around a large layout. Feeders to a track would be much smaller wires as current demands would be smaller. Relay coils and small wattage transformers may have gauges from 18AWG down to 28AWG. Wirewrap wire is generally 26AWG. While this paragraph is fairly general, it will give you an idea what to expect for wire sizes on a layout or simple projects. Better detail and recommendations can be found elsewhere in the Forum for a specific task.

AWG is not the same as Standard Wire Gauge. There is no direct conversion in the ratio of wire diameter between AWG and SWG.

http://www.hardwarebook.net/table/AWG.html
http://www.simetric.co.uk/siwire.htm

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