Glossary of common EMF/RF terms

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Page 1 is a primer – best read in order down the page. Page 2 - remaining terms in alphabetical order.

Electromagnetism	is one of the four fundamental interactions between things in nature
Electromagnetic fields	measureable forces between objects due to electric charge or current
Frequency	the number of vibrations per second. One per second is 1 Hertz (1 Hz)
	common multiples are: **k**ilo (1000), **M**ega (1 million), **G**iga (1 billion 10^9)
Wavelength	the distance between the crests of the vibrating wave
Power-frequency	electric and magnetic fields that vibrate at 50 or 60 Hz plus harmonics
Harmonics	multiples of the main frequency – usually unwanted effects of imperfections
Radio-frequency	electromagnetic fields vibrating 3000 to 3 x 10^9 Hz that can travel through space
Near field	within 2 wavelengths of source consider electric & magnetic fields separately
Far field	further than 2 wavelengths from the source treat it as a radiated wave.
EMF	usually Electric and Magnetic Fields related to use of electric power
ELF	Extremely Low Frequency (usually taken to be 3 Hz to 3000 Hz)
RF	usually taken to mean the range 3000 Hz to 300 GHz (to 3 x 10^9 Hz)
Microwaves	usually taken to mean RF at frequencies above 300 MHz (1 metre wavelength)
Field strength	electric field strength usually measured in volts per metre (V/m)
	magnetic field strength usually measured as magnetic flux in microteslas (µT)
	In the USA milliGauss are used. 1 microtesla = 10 miiliGauss (mG)
	for RF usually measured in V/m and may be the best bio-activity metric
Power density	is the amount of power (time rate of energy transfer) passing per unit area
	Environmentally usually measured in microwatts per square metre (µW/m^2)
	The USA use miiliwatts per square cm (1 mW/cm^2 = 10,000,000 µW/m^2)
Peak reading meter	gives highest values of the peaks of the signal. Higher than "maximum hold"
Average reading meter	gives the average value of the signal and can also have "maximum average hold"
Broadband meter	gives a value that totals all the RF within the instrument's frequency range
Spectrum analyser	gives a continuous graph of the signal levels across the range it is set to
EIRP	a standardised measure of RF power radiated by an antenna (complicated!)
Modulation	the way useful information is coded on to an electromagnetic wave
AM	amplitude modulation – changes the power of the carrier wave
FM	frequency modulation – changes the frequency of the carrier wave slightly
TDMA	Time Domain Multiple Access – multiple users share carrier in different time slots
CDMA	Code Division Multiple Access – multiple users share spectrum using encryption
Analogue or 1G	various early mobile phone systems which varied around the world from 1980s
2G or GSM	first digital mobile phone system introduced from 1991
3G or UMTS	second main-stream digital mobile phone system introduced from 2001
4G or LTE	(Long Term Evolution) third main-stream digital system introduced c. 2012
WiMax	another digital communication system.
WiFi	any wireless area network (wLAN) base on any of the IEEE 802.11 Standrds
wLAN	any wireless area network (includes many types for different applications)
dLAN	digital wLAN to send signals around ordinary home wiring (HomePlug Standard)
DECT	digital cordless phone system that generally pulses microwaves at 100 Hz 24/7

ADSL	Assymetric Digital Subscriber Line - a phone line that can also carry *Broadband*
Broadband	wide bandwidth (= fast) internet service (by telephone, cable or wireless)
Bluetooth	patented method for short range RF communication between electronic devices
BTFon (now BT WiFi)	BT uses HomeHubs in subscribers homes to provide over 5M free WiFi hotspots
CFL	Compact Fluorescent Lamp – an efficient by electrically noisy light bulb
DAB radio	digital replacement for FM radio. Transmits about 225 MHz. Many channels.
Dirty Electricity	high-frequency noise on mains wiring. Some researchers claim this is unhealthy
DNO	electricity Distribution Network Operator responsible for substations etc
Earthing	connecting things and people electrically to Earth using wire.
EIA EMF	Environmental Idiopathic Intollerance to EMF exposure
EHS	Electrically hyper-sensitive (original name for EIA EMF)
ES	same as EHS (Electrical Sensitivity)
Halogen lights	bright quite efficient lights that have a daylight hue (high blue content)
Homeplug	the main standartd used for *dLANs.*
Induction hob	a cooking hob that uses high EMFs (20 – 85 kHz) to heat metal cookpans.
HAN	Home Area Network (primarily used by Smart Meters)
Net current	out of balance current in a cable. Causes elevated magnetic fields nearby.
Stray current	diverted fault current flowing in thinks like metal pipes
IARC	International Angency for Reaserch on Cancer – part of *WHO*
ICNIRP	International Commission on Non-Ionising Radiation. An NGO.
PDA	a personal digital (or data) assistant - largely replaced by smartphones.
SAR	Specific Absorbed Radiation (in W/kg) – RF energy absorbed by body tissue
SCENIHR	EC Scientific Committee on Emerging and Newly Identified Health Risks
Smart Meters	Utility meters that can communicate two-way with the suppliers
SMPS	switch mode power supplies – efficient but can create lots of *dirty electricity*
Tablet	small flat computer than communicates by wireless (iPad and other makes)
Transients	short sudden changes in EMF that cause interference and may be bio-active.
WAN	Wide Area Network – such as a cellular mobile phone network
WHO	World Health Organisation
Zigbee	Patented short-range communication system for electronic devices
Z-wave	Patented short-range communication system for household appliances