



Glossary of Embedded Systems Terminology

A.1 Scope

This glossary defines terms in the field of Embedded Systems. Topics covered include the main aspects of **ES**: business, environment, systems, software, and hardware. The majority of the concepts definitions were retrieved from the **IEEE** Standard Glossary of Software Engineering Terminology (**RADATZ; GERACI; KATKI, 1990**) while the remaining, from articles, books, and websites. This initial glossary encompasses 43 terms, and its last update was in July/2016.

A.2 Glossary Structure

Entries in the glossary are arranged alphabetically. An entry may consist of a single word, such as “software,” a phrase, such as “test case,” or an acronym, such as “CM.” Phrases are given in their natural order (test plan) rather than in reversed order (plan, test).

Only one cross-reference is used to show a term’s relationships to other terms in the dictionary:

- *See* refers to a preferred term or to a term where the desired definition can be found.

A.3 Definitions for Embedded Systems Terms

abstraction level. A view of an object that focuses on the information relevant to a particular purpose and ignores the remainder of the information.

action. It is an activity performed by the system.

actuators. An actuator is any actuator in the environment which can receive commands from the system to act on the environment context.

business. An organization or enterprising entity engaged in commercial, industrial or professional activities.

business rule. A business rule is a statement that describes a business policy or procedure. Business rules are usually expressed at the atomic level, that is, they cannot be broken down any further.

CAN. A Controller Area Network (CAN bus) is a vehicle bus standard designed to allow microcontrollers and devices to communicate with each other in applications without a host computer. It is a message-based protocol, designed originally for multiplex electrical wiring within automobiles, but is also used in many other contexts.

context. A context is a state of the world that is relevant to an actor goal.

control variables. It is a variable that is constant and unchanged throughout the course of the investigation.

controller. A controller, in a computing context, is a hardware device or a software program that manages or directs the flow of data between two entities.

domain knowledge. In general, a domain is an area of control or a sphere of knowledge.

embedded systems. An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular function.

environment. It is the characteristics that surround the system. Environment includes information like temperature, atmospheric pressure, humidity, rainfall, wind speed, and others.

environment variables. Environment variables are a set of dynamic named values that can affect the way embedded systems will behave.

environmental requirements. It is environmental constraints like human users, temperature, and local of operation required by the system.

external interface. It is the external communication (USB, CAN, Serial and others).

functional requirements. It is a functionality of the system. A goal that must be attended.

hardware. Physical equipment used to process, store, or transmit computer programs or data.

hardware adapter (interface). An adapter is a physical device that allows one hardware or electronic interface to be adapted (accommodated without loss of function) to another hardware or electronic interface.

hardware behaviour. It is a function performed by hardware.

hardware device. *See:* **hardware.**

hardware requirements. Defines hardware characteristics that it should provide to the software.

legacy hardware. Hardware that is obsolete. *See:* **hardware.**

memory RAM. Memory is the electronic holding place for instructions and data that your computer's microprocessor can reach quickly.

memory ROM. Random-Access Memory (RAM) is a form of computer data storage. A random-access memory device allows data items to be accessed (read or written) in almost the same amount of time irrespective of the physical location of data inside the memory.

microcontroller. A highly integrated microprocessor designed specifically for use in embedded systems. Microcontrollers typically include an integrated CPU, memory (a small amount of RAM, ROM, or both), and other peripherals on the same chip.

microprocessor. A piece of silicon containing a general-purpose CPU.

non-functional requirements. A feature or characteristic that affects an item's quality.

power supply. It is the power supply of the product (battery, stack or external source).

processor. A processor is the logic circuitry that responds to and processes the basic instructions that drive a computer.

quality attributes. *See:* **non-functional requirements.**

role. It is a function performed by an agent (customer, engineer, and others).

sensors. A sensor is any system providing up-to-date information about the context where the system is running.

serial. In computing, a serial port is a serial communication interface through which information transfers in or out one bit at a time (in contrast to a parallel port).

software. Computer programs, procedures, and possibly associated documentation and data pertaining to the operation of a computer system.

software behaviour. It is a function performed by software.

software interface. It is a software responsible to connect one or more softwares.

software requirements. Defines the services that the system should provide and they set out constraints on the system's operation.

stakeholders. A person, group or organization that has interest or concern in an organization or (system).

storage device. Storage devices are any type of hardware that is capable of storing and retrieving data. Most often these devices come in the form of hard drives or optical discs.

USB. USB is an increasingly popular replacement for slower serial and parallel ports, especially for connecting to general-purpose computers. In addition to higher throughput, USB also offers the ability to power downstream devices and to connect a much larger number of devices.

user interface - input. An interface that enables information to be passed between a human user and hardware or software components of a computer system.

user interface - output. An interface that enables information to be passed between a human user and hardware or software components of a computer system.

A.4 References

The references used in building this Glossary were the following: (RADATZ; GERACI; KATKI, 1990), (SOMMERVILLE, 2011), (DALPIAZ; GIORGINI; MYLOPOULOS, 2009), (WHATIS, 2009), (WHATIS, 2012), (WHATIS, 2006), (WHATIS, 2015), (FIRESMITH, 2006), (WHATIS, 2005), (BARR, 2016), and (REFERENCE, 2016).