

Embedded systems

Embedded systems are small computer systems with a specific purpose and which are built in to a larger, physical system or device:

- central heating system
- engine management system in a car
- dishwasher or washing machine

End users normally can't change the programs within them – they come with programs built in.

Embedded systems

These are not General Purpose Computers:

- one set of tasks only
- can't be programmed by the user
- cheaper to make
- less power required (may run off batteries)
- **specialised** — have a limited number of jobs they can do

Embedded systems

Operating system is often **firmware** – permanent software programmed in ROM.

Some systems can be updated

Programmed using lower level programming languages – **assembly language** or a simple language such as **C**

Embedded systems

C is a high level language - but a simple one

“The bottom line is that embedded programmers aren't going to stop using C anytime soon.

- **C compilers** are available for the vast majority of 8-, 16-, and 32-bit CPUs
- C offers just the right mix of **low-level** and **high-level** language features for programming at the processor and **driver level**”

Embedded systems

Key points:

- **built in** to a system or device
- **specialised**
- can't be programmed by end user
- use **firmware**
- often programmed using **assembly language** or a simple high-level language such as C