

Programmers Model

Cortex-M4

What Does Programmer's Model Mean?

« The tools you have available to build your next piece of furniture »

« The components you have to build your next analog circuit »

« The pens, crayons and watercolors you have to make your next drawing »

« It explains the interface the programmer must use to design their application on this processor »

2.1.1 Processor mode and privilege levels for software execution

The processor *modes* are:

Thread mode: Used to execute application software.

The processor enters Thread mode when it comes out of reset.

The CONTROL register controls whether software execution is privileged or unprivileged, see [CONTROL register on page 24](#).

Handler mode: Used to handle exceptions.

The processor returns to Thread mode when it has finished exception processing.

Software execution is always privileged.

The *privilege levels* for software execution are:

Unprivileged: *Unprivileged software* executes at the unprivileged level and:

- Has limited access to the MSR and MRS instructions, and cannot use the CPS instruction.
- Cannot access the system timer, NVIC, or system control block.
- Might have restricted access to memory or peripherals.
- Must use the SVC instruction to make a *supervisor call* to transfer control to privileged software.

Privileged: *Privileged software* executes at the privileged level and can use all the instructions and has access to all resources.

Can write to the CONTROL register to change the privilege level for software execution.

