Software for Micros

Types of Software Used With Microcontrollers

There are three types of micro software: application, development, and operating systems (OS)

Application software refers to the software that is usually stored in ROM or flash and is dedicated to the specific application.

Development software is the software used to create the programs for the applications.

An operating system is needed to manage multiple applications programs on large micros.

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Development Software

The development software that is used to create the programs for the applications is an integrated development environment (IDE) that includes editors, linkers, debuggers, and software libraries.

Editors, like a word processor, are used to enter a program. Linkers are used to connect subroutines together. Debuggers are used to troubleshoot the program. Software libraries contain the algorithms and subroutines.

The programming languages most commonly used are Assembler, C, C+, and C++.

Operating Systems (OS)

Most small scale micro applications do not need an operating system. The application program is small and totally dedicated to the application.

Large micros are capable of running several programs concurrently (not simultaneously) in a time shared fashion. An operating system is needed to manage multiple applications programs.

If multiple memory and I/O operations must be controlled an OS can manage those.

Most 32 and 64-bit processors need an OS.

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Operating Systems Used With Microcontrollers

Operating systems are needed with larger more powerful micros that have larger, complex programs and multiple applications per processor.

The OS coordinates all operations, interprets inputs, issues outputs, and manages memory and I/O resources.

There are many operating systems for embedded controllers. Some examples are Windows CE, VxWorks, QNX, LynxOS, Linux embedded, LynuxWorks, and Green Hills.

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Embedded Software Development Process

The development process for embedded software requires several steps. The first step is to define the functions that are to be performed and all inputs/outputs.

Next the programs are written. There are usually multiple subroutines for each operation linked together. Many programs use subroutines from available software libraries.

These subroutines are then assembled into one program.

The program must then be tested to see that it fulfils the design requirements. This is done by downloading the program to the flash memory.

Next the programmed must be debugged and the errors corrected through changes and additions. The program must then be retested.

Finally the program must be assembled under operating system if one is used and tested again.

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Part 2: Popular Microcontrollers and Software
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Software for Micros

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