

Rumors of the demise of the low-end x86 have been greatly exaggerated

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x86-based microprocessors have been used in embedded computing designs for years.

Many of them are no longer available or are very close to the end of their product life.

Not all is lost, however – designers have a few options that can replace these processors and help ship products well into the future.

If you are lamenting the recent End-Of-Life (EOL) notifications issuing from most of the former producers of 186, 286, 386, and 486 microprocessors you are not alone. These versatile, reliable workhorses of the embedded market provided the basis for thousands of innovative useful products during the last 20-plus years, and their discontinuance will cause significant disruption in the industry.

If you are an engineer in almost any industry creating products for embedded applications you either have used one of these processors in your designs or have used equipment containing one of them in developing an end product.

The embedded market has inherited the residual wealth from rich uncles in the desktop market for a number of years. Every time an uncle stopped selling a processor in the lucrative desktop market it

was moved into the *embedded division*. The problem is that the flow of products entering the embedded market from the desktop market continuously squeezes out earlier entrants.

As the need for speed in the desktop continues to drive semiconductor manufacturing process nodes, older processes are displaced. Microprocessors manufactured in process nodes no longer command premium prices and thus do not warrant the significant costs necessary to migrate them to newer processes. Add to that the fact that many of the original architects who designed these devices no longer work in the industry or have moved on to work on the *latest and greatest*, and the problem of keeping legacy designs in production becomes even more difficult. Finally, the peripherals normally wrapped around a discrete CPU have also aged, with many fading into history as fast as CPUs.

Typical applications using x86 processors: industrial control, point-of-sale, diagnostics, data acquisition, telecom, process control, instrumentation, data logging, medical instruments, gambling machines, vending machines, vehicular navigation systems, security systems, information kiosks, remote monitoring, numerical control, inventory control, and robotics.

