

- **category:** Hardware
- **name of product:** ARMv8-R architecture

The ARMv8-R architecture significantly enhances ARM's real time 32-bit processor solutions with new features suitable for the rapidly-expanding number of safety-related applications in automotive and industrial control.

The key innovation in the ARMv8-R architecture is the introduction of a 'bare metal' Hypervisor mode which enables programmers to combine different operating systems, applications and real-time tasks on a single processor whilst ensuring strict hardware-supported isolation of software.

For example in automotive electronics, a processor from ARM® Cortex® Cortex-A processor family would currently power the Infotainment system, whereas real time systems would be powered by a large number of MCUs. The new ARMv8-R architecture enables a Linux or Android based Infotainment system to run on the same processor as a RTOS-based control system. Unit costs will be reduced because software can be consolidated onto a single processor, with complete isolation of safety-critical code for automotive applications. This safety integrity, combined with higher performance, makes processors based on the ARMv8-R architecture ideally suited for emerging automotive applications such as Advanced Driver Assistance Systems and Vehicle to Vehicle communications.

The benefits are also significant for industrial automation OEMs. It will be possible to combine a Linux OS for graphics and networking functions with real time machine control on a single processor, with cost and integration benefits for HMI and machine builders.

Other ARMv8-R architecture features include an improved memory protection scheme which substantially reduces context switching time, ARM NEON™ advanced SIMD instructions for significantly improved radar and image processing tasks and instructions carried over from the ARMv8-A architecture such as CRC (Cyclic Redundancy Check) for use in detecting the corruption of program code or data.