



Exoskeletons

PikeOS RTOS & Hypervisor

Proven Platform for a Safe & Secure Operation

Exoskeletons are literally on the rise. However, this is not a cause for alarm, but a reason for confidence, because they make many tasks much easier and less physically demanding. In addition to work-related aspects, exoskeletons can also be used sensibly in the medical field, for example as a walking aid for people who would otherwise no longer be able to move selectively or completely.

Exoskeletons can be used intralogistically for lifting heavy objects such as packages, pallets, machine parts. In addition, physically hard-working craftsmen will benefit in the future with strength-sapping processes such as overhead work.

With the combination of PikeOS, PikeOS for MPU and a system-on-a-chip (SoC) module from TQ Systems' i.MX8 series, such as the TQMa8XX, embedded systems for exoskeletons can be conveniently realized. The TQMa8XX offers high flexibility, operationally reliable ECC memory, outstanding scalability of computing power with enough reserves for all eventualities, maximum energy efficiency, and digital signal processing (DSP) for voice control.

SOLUTION

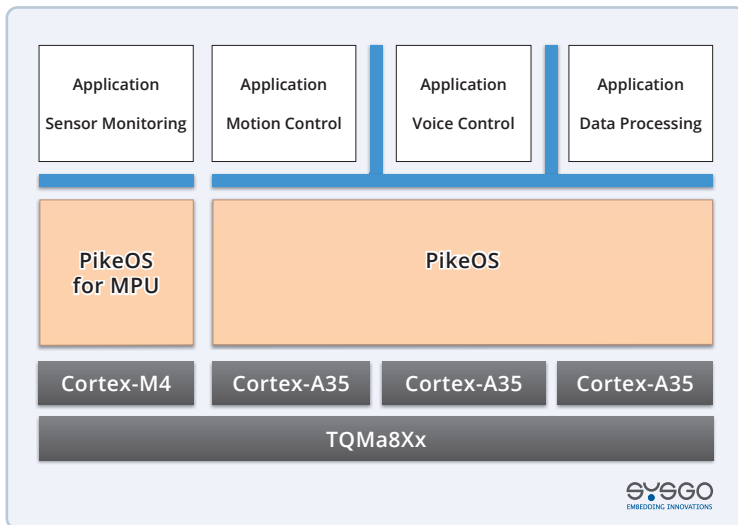
The real-time operating system and hypervisor PikeOS provides the basis here for separating applications in the embedded system functionally safely in space and time. For example, mixed-critical motion control can run in parallel with speech processing and performance data monitoring without one application interfering with the other.

Functional Safety can be achieved via SYSGO's certification kits, which are available for PikeOS for the IEC 62304 Medical Safety standard and the IEC 61508 industry Safety standard, among others. An it-secure gateway can run on another PikeOS partition on a core. With its pre-certification against the Common Criteria Security standard at level EAL 5+, the PikeOS Separation Kernel (ver. 5.1.3.) also provides Cyber Security at the highest level.

On customer request, after appropriate adjustment by means of Board Support Package, PikeOS for MPU can run on the microcontroller (Arm Cortex-M4), which is located on the heterogeneous TQMa8Xx, as a safely separated partition. PikeOS for MPU takes over important tasks, where one prefers a microcontroller over a CPU for reasons of higher-level Safety or manageability, among other things. This can be for example the deterministic processing of large amounts of data.

With the integrated development environment CODEO such embedded systems, which make highest demands on Safety, determinism or real-time and consolidation, can be created within one tool. PikeOS and PikeOS for MPU do not require a large toolchain, but find a common roof on the Eclipse-based IDE CODEO.

PIKEOS SOFTWARE ARCHITECTURE



TQMa8Xx

The high flexibility, scalability, energy efficiency and operationally safe ECC memory make TQMa8Xx suitable for use in exoskeletons.

About TQ Systems

As a technology service provider and electronics specialist, the TQ Group implements customized, innovative solutions for various industries – from development to production and other services to product lifecycle management. One focus is embedded processor technology: whether x86, Arm, QorIQ Layerscape or Power Architecture – the goal is to provide the latest processor technology in the form of embedded modules, SBCs, industrial PCs, modular solution platforms and finished systems. More information at www.tq-group.com

About SYSGO

Founded in 1991, SYSGO became a trusted advisor for Embedded Operating Systems and is the European leader in hypervisor-based OS technology offering worldwide product life cycle support. We are well positioned to meet customer needs in all industries and offer tailor-made solutions with highest expectations in Safety & Security. More information at www.sysgo.com/medical