



Commercial Drones & Unmanned Aerial Vehicles (UAV)

PikeOS RTOS & Hypervisor

Proven Platform for a Safe & Secure Operation

The number of commercial drones has been increasing rapidly in recent years. From what was once the hobby area of a few tinkerers, many applications are making more and more sense in the professional field as technology advances. These include drones with infrared sensors that can help in the search for missing persons, as well as those with LiDAR for geological surveying of areas or – widely used – drones with optical sensors or cameras for capturing objects from the air.

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 TQMa8Xx4, embedded systems for drones can be conveniently realized. The TQMa8Xx4 offers outstanding scalability of computing power with enough reserves for all eventualities, 4K graphics support, highest energy efficiency thanks to Cortex A-35, and a large memory that provides space for the procession of large amounts of data.

SOLUTION

The real-time operating system (RTOS) and hypervisor PikeOS provides the basis here for separating applications in the embedded system functionally safely in space and time. For example, mixed-critical flight control can run in parallel with video recording of the drone without one application interfering with the other.

Functional Safety is guaranteed by pre-certifying PikeOS against the DO-178C Avionics Safety standard at the highest level, DAL A. 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 (v5.1.3.) also offers Cyber Security at the highest level.

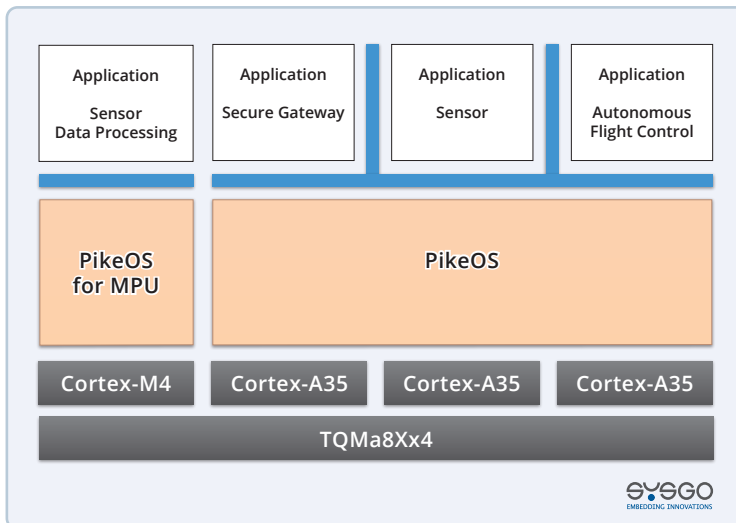
On customer request after appropriate adjustment by means of Board Support Package, PikeOS for MPU can

run as a functionally safe separated partition on the microcontroller (Arm Cortex-M4), which is located on the heterogeneous TQMa8Xx4.

PikeOS for MPU takes over important tasks where one prefers a microcontroller over a CPU for reasons of higher-level Safety or manageability, among others. This can be, for example, the deterministic processing of large amounts of data, as they occur in video recording.

With the integrated development environment CODEO, such embedded systems, which have the 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



TQMa8Xx4

The TQMa8Xx4 is recommended for drones of all kinds, thanks to its high scalability, computing power and energy efficiency.

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/avionics