



Industry Solution

Industrial Automation

FOCUS ON THE COMPETITIVE EDGE IN A TIGHT MARKET – Industrial Automation systems include complex software systems with all kinds of requirements: measuring and control devices, graphical user interfaces, communication stacks. A new software architecture approach allows safe and secure integration of these components on a single hardware.

PIKEOS HYPERVISOR AND INTEGRATED LINUX

Varying requirements for safety and security in Industrial Automation applications need a system architecture that provides a competitive advantage in development, certification, and long-term maintenance. PikeOS Hypervisor is the appropriate foundation for this kind of systems. It consists of a small, certifiable micro-kernel, upon which a virtualization infrastructure provides partitions allowing to house diverse resource and function needs in individual partitions. PikeOS provides a broad variety of GuestOSs to support diverse Industrial Automation application architectures from graphic applications to time-critical measurement systems and safety-critical control functions. Thanks to separation technology, Linux applications and proprietary intellectual property can be divided into separate partitions, thus avoiding the application of GPL to proprietary code.

CERTIFIED ACCORDING TO IEC 61508

Many Industrial Automation products have safety requirements according to IEC 61508. PikeOS is the best

certification solution for three reasons: small size, criticality partitioning, and unparalleled company support for the certification process. As PikeOS is purpose-built to meet these requirements, its main features are implemented in about 10.000 lines of code. Its partitioning concept enables the certification of applications to their individual required safety integrity levels while running in parallel on the same hardware. Equally important for certification is a competent and reliable partner when it comes to documentation, requirements and tests. For over 15 years, SYSGO supports its customers with own resources, engineers, workshops and training, as well as with artifacts and provision of source code.

“Historically, it’s been difficult to maintain technology based on aging hardware platforms. PikeOS allows us to make choices that fit today’s needs while knowing that our investments are secured for the future.”

Werner Ganahl, CEO
Gantner Instruments

WHY PIKEOS FOR INDUSTRIAL AUTOMATION

Cost and time pressures are decisive factors in the development of industrial equipment. Unfortunately, manufacturers typically face disruption from rapid obsolescence of hardware and fast software update cycles. PikeOS restores control over software development processes and brings predictability to life cycle costs:

- 1. Extreme flexibility provides independence from suppliers in the choice of hardware and software:**
PikeOS supports a broad range of hardware architectures and provides interfaces for a wide array of personalities. It is easy to add additional architectures and interfaces (including for legacy code) and therefore to manage hardware obsolescence.
- 2. Partitioning provides the basis for a pragmatic Linux strategy:** PikeOS offers an integrated Linux personality to include open source features for communication (e.g. Ind. Ethernet, field-busses, wireless, OPC etc.), Graphical user interfaces and device management. Your own intellectual properties, real-time functions and safety-critical applications run in separate partitions.
- 3. Integrated safety reduces certification costs:** Applications of various levels of safety and security are separated from one another in distinct partitions and certified separately.

INDUSTRY ECOSYSTEM AND COLLABORATIONS

Industrial Automation projects use a wide range of software and hardware products. Flawless interaction between the components used is vital to the success of complex projects. For this reason, we have been working in close collaboration with the leading global Industrial Automation suppliers for many years now. We support a wide selection of hardware platforms with our software products and have developed interfaces for code generators and analysis tools which are constantly being expanded.

PIKEOS GUEST OS

Partitions can host different personalities, i.e. guest operating systems, run-time environments (RTE) and APIs, on top of the hypervisor running in non-privileged mode. Industrial Automation personalities include:

- Linux · Android
- Certified POSIX
- iTRON · Java · Native

THE ECOSYSTEM

- aicas · ARM · Atego
- Esterel · Freescale
- Infineon · Intel
- Lauterbach · MEN

- MIPS · Presagis · Rapita
- Renesas · TTTech
- Vector Software · Xilinx

INDUSTRIAL AUTOMATION ARCHITECTURES (SINGLE & MULTI-CORE)

- ARM · x86 · PowerPC
- SPARC V8 · MIPS

MORE CUSTOMERS

- Baumüller
- Bucyrus / Caterpillar
- Gantner · Gatso Meter
- Görlitz · ICA chip
- Kongsberg · Meyn
- Putzmeister · Stäubli
- SWARCO

PIKEOS IN ACTION: PIKEOS AND LINUX USED IN MINING EXCAVATOR

Bucyrus (Caterpillar) chose PikeOS for IP protection, investment protection and obsolescence management. PikeOS was ported to a new hardware platform and configured to provide two different partitions, one running legacy code on a POSIX API, and the other running new applications on Linux. Software investments on the excavator product line are protected and complemented by Linux programs running within the Linux partition. Secure partitioning mechanisms ensure that each application remains independent. Existing IP is protected in its own partition and cannot be accessed from Linux.

