

SOLUTION BLUEPRINT

# Safe Combination of Soft-PLC and Linux

Solution Provider



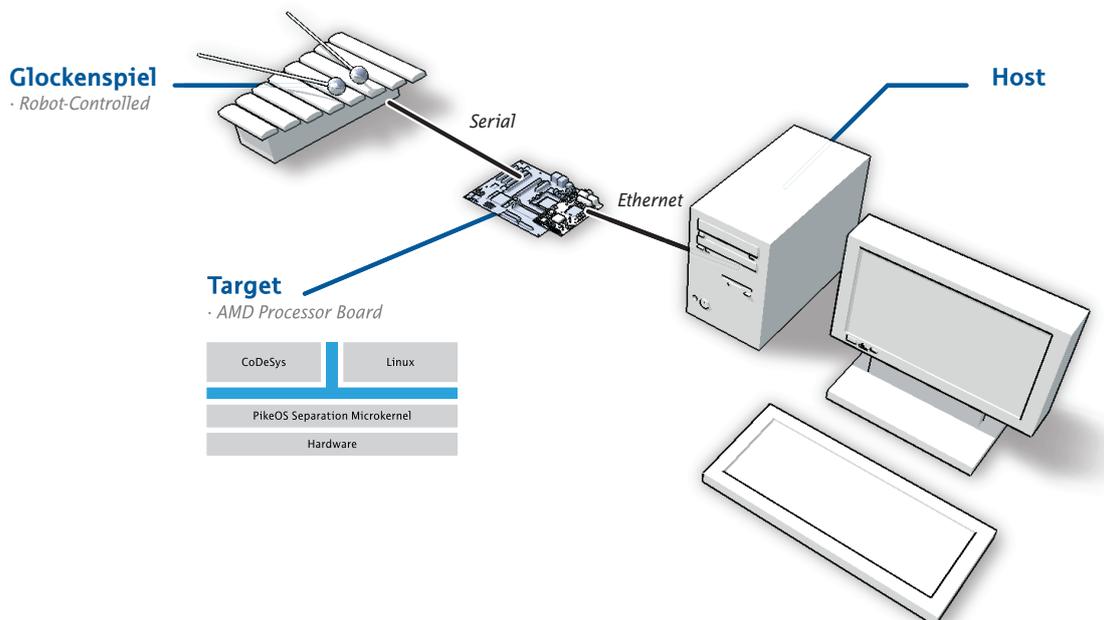
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The usage of a soft-PLC instead of a standard PLC is more and more likely in the automation industry. Instead of using dedicated hardware to realize a PLC, it is much more cost effective to use a commercial off-the-shelf (COTS) hardware with a software based PLC.

To run a soft-PLC a deterministic operating system has to be the basis. Using PikeOS with its partitioning capabilities as the basis for a soft-PLC will open up new possibilities for the utilization of COTS hardware in conjunction with PLC functionality in a deterministic and safe environment.

### Combining Soft-PLC and Linux

The demonstration features the PikeOS Microkernel, serving as a secure separation kernel, supporting both, a real-time soft-PLC and a fully blown Linux system, on a single physical machine. The PikeOS kernel is configured to support two partitions. One of the partitions hosts the soft-PLC runtime system CoDeSys by 3S Smart Software Solutions. This soft-PLC demonstrates its hard



real-time capabilities by playing a melody on a glockenspiel in perfect timing. At the same time, the second partition hosts a fully-blown Linux system on the same physical machine. The secure separation between the two partitions is demonstrated by deliberately crashing or rebooting the Linux system while the soft-PLC continues to perform unaffected. Practical use cases of this approach include the use of soft-PLC to perform safety-critical control operations while at the same time having a Linux system, providing support for the wide range of readily available software. Since the two systems are securely separated from each other by the PikeOS Microkernel, different safety integrity levels (SIL) may be applied to each of them.

### About 3S – Smart Software Solutions

The German software specialist 3S Smart Software Solutions is the manufacturer of the market leading IEC 61131-3 programming tool CoDeSys. The integrated compilers in CoDeSys which translate the controller application into machine code, guarantee an optimal performance on the processors in use. As a complete automation suite, CoDeSys offers integrated product extensions for motion control or visualization.

The new CoDeSys 3.0 unites the functionality of the successful programming system CoDeSys with state-of-the-art technology: CoDeSys 3.0 is a complete automation platform and offers real object oriented programming with version profiles, network programming and an integrated IEC visualization.

### About SYSGO

SYSGO is specialized in design, implementation and configuration of device software for the embedded market. Besides SYSGO's real-time operating system solution for safety-critical systems, PikeOS, and the Embedded Linux development environment, ELinOS, SYSGO offers the development of device drivers, board support packages and firmware. SYSGO supports its customers with services for Embedded Linux, real-time and certification for safety-critical applications. The target markets are Aerospace & Defense, Industrial Automation, Automotive, Consumer Electronic and Network Infrastructure. SYSGO's customers include DaimlerChrysler, EADS Airbus, EADS Military Air Systems, Honeywell, IBM, Raytheon, Rheinmetall, Rockwell-Collins and Rohde & Schwarz. SYSGO AG was founded in Mainz, Germany, in 1991 and was reincorporated as a joint stock company in October 2002. The company has six facilities in Germany and Europe and provides a global distribution network.