

Industrial Networking

EtherCAT® Programmable Logic Controller Reference Platform



Featuring the QorIQ TWR-P1025 processor



The partnership of Freescale, QNX®, ISaGRAF® and koenig-pa GmbH (KPA) provides a programmable logic controller reference platform for easier industrial control system development.

Overview

The new programmable logic controller (PLC) reference platform is equipped to ease development of industrial control systems.

The PLC reference platform implements the KPA EtherCAT® Master protocol with an ISaGRAF® PLC Firmware and QNX® Neutrino® RTOS on the high-performance QorIQ P1025 processor. It is supported by powerful development tools from all four companies, including the KPA EtherCAT® Studio, ISaGRAF 6 Workbench, QNX Momentics® tool suite and our CodeWarrior Development Suite.

The EtherCAT master and slave modules daisy chain to eliminate switches and routers, reducing complexity and cost for factory automation, process control, industrial drives, motion control and safety devices. No additional field bus processor is necessary on the EtherCAT master, thus the master stack can directly write the output of application to the slaves. The PLC reference platform delivers millisecond response time for EtherCAT while using just one percent of one core in the dual-core QorIQ P1025 processor, with plenty of headroom remaining for the control application.

About KPA EtherCAT Master and EtherCAT Studio

The KPA EtherCAT Master offers easy-to-use, hard real-time performance, enabling users to configure and monitor network activity.

The KPA EtherCAT Master is implemented in C for high performance and offers scalable EtherCAT features like cable redundancy, hot connect and multiple master. KPA EtherCAT Studio users can easily configure the EtherCAT network and get help in case of faults. Useful features include data logging with triggering, timing analysis without external tools, project comparison, topology viewer and more.



ISaGRAF Firmware and ISaGRAF 6 Workbench

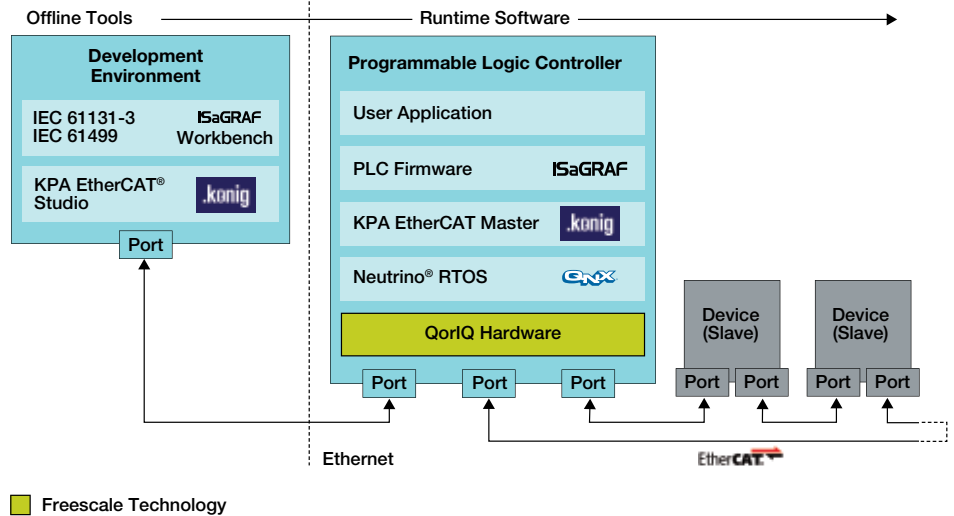
The ISaGRAF PLC firmware allows developers to easily create feature-rich control systems requiring industry-standard control languages such as IEC 61499 and IEC 61131-3. This allows easier reuse of existing applications on new platforms based on QorIQ processors and the QNX Neutrino RTOS. In addition to the firmware, ISaGRAF provides a complete control application development environment called the ISaGRAF 6 Workbench, which features a suite of plug-ins for features such as IEC 61131-3 compliant languages, an integrated HMI, and the integration of KPA Studio to provide integrated EtherCAT slave management. ISaGRAF's modularity allows OEMs to create a customized Workbench with only the functionality required for their control product.

QNX Neutrino RTOS and Momentics Tool Suite

The QNX Neutrino RTOS is a full-featured and robust OS that scales down to meet the constrained resource requirements of real-time embedded systems. Its true microkernel design and modular architecture enable customers to create highly optimized and reliable systems with low total cost of ownership. It offers a field-proven, clean strategy for migrating from single-core to multicore processing. QNX Neutrino is certified to IEC 61508 Safety Integrity Level 3 (SIL3) and Common Criteria ISO/IEC15408 Evaluation Assurance Level (EAL) 4+. QNX Neutrino is widely used in many industrial applications including programmable logic controllers, robotics and factory automation.

The QNX Momentics Tool Suite is a comprehensive, Eclipse-based integrated development environment with innovative profiling tools for maximum insight into system behavior. These unique tools give developers at-a-glance views of real-time interactions, memory profiles and more, enabling shorter debug times and faster time to market. Multicore-specific tools help developers migrate code cleanly from single-core to multicore systems and safely optimize performance.

EtherCAT® Programmable Logic Controller Reference



QorIQ Processors and CodeWarrior Development Suite

QorIQ communications processors include single-, dual-, quad- and many-core processor architectures with integrated support for communication protocols such as EtherCAT, EtherNet/IP™, PROFINET and PROFIBUS. The P1 processor family includes single- and dual-core variants which scale up to 5,700 million instructions per second if needed to support more complex control algorithms. Customers may either distribute processing functions across two cores, or isolate real-time control functions on one core while running maintenance and communications functions on the other core. In addition, the Freescale Product Longevity Program offers up to 15-year availability for selected products. For terms and conditions and to obtain a list of available products, visit freescale.com/ProductLongevity.

Freescale control and network processor solutions are engineered to meet the challenging safety, security and reliability requirements of manufacturing, processing and critical infrastructure facilities.

CodeWarrior Development Studio is a comprehensive integrated development environment that provides a highly visual and automated framework to accelerate the development of the most complex embedded applications. Integrated within the Eclipse development framework, Freescale CodeWarrior development tools for Power Architecture® technology combine Linux® build tools and highly advanced multiprocessor and multicore debugging with software analysis capabilities, allowing you to build, debug and optimize the performance of Freescale Power Architecture-based multicore applications.

Try It Out

The PLC reference platform is based on the QorIQ P1 Tower System module, available for purchase directly from Freescale and our distribution partners for \$199 USD (suggested resale price). The complete reference platform, including hardware, software and evaluation tools is available now from Freescale and our partners, as described at freescale.com/goPLC.

For more information, please visit freescale.com/goPLC

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