Kithara
THE PULSE OF REALTIME

Real-Time IEC 61131-3 PLC

IEC 61131-3 compatible Programmable Logic Control on Windows®

During the years the »RealTime Suite«™ has been used for high-performance solutions for Windows® by numerous manufacturers of testing rigs, as well as in mechanical engineering, automation and robotics. Now the integration of software-based Programmable Logic Control is made possible in real-time applications.

Kithara Software provides a Soft-PLC solution compatible to the IEC 61131-3 standard for real-time automation under the Windows® operating system family. This allows to reuse existing PLC code or just benefit of the powerful features of IEC 61131-3 programming languages. These are easy to use and provide integrated mechanisms like real-time multi-tasking on dedicated CPUs, topology variables, function blocks and special data types.

The PLC Module is seamlessly integrated into the Kithara »RealTime Suite«. Both Instruction List (IL) and Structured Text (ST) are supported languages. The PLC binary generated by the highly-optimizing compiler is loaded into the real-time context and has an open interface to real-time parts written in other programming languages (like C/C++, Delphi or C#).

The PLC Module also supports object-oriented extensions upcoming in the next version of the standard.

www.kithara.de

Kithara »RealTime Suite« – PLC Module

PLC Module features:

Standard IEC 61131-3

- Instruction List (IL) or Structured Text (ST)
- Data types: integers, bit types, floating point, time and date types, strings, arrays, structs, enumerations, subranges, unions
- Implicit type conversion
- Binary, octal, decimal, hexadecimal literals
- Variables: input, output, inoutput, external, global, temporary, retainable
- Program organization units: programs, functions, function blocks
- Configurations and resources: divide topology in separate units; assign topology variables; initialize program or function block variables; assign tasks; manage program instances; pass through program parameters
- Namespaces: internal and public access
- Pointers and References

Object-oriented

- Classic function blocks with optional object-oriented features with polymorphism
- Classes with inheritance: abstract, final
- Multiple implementable interfaces with inheritance
- Methods: public, protected, private, internal, override, abstract, final
- Members: public, protected, private, internal
- Interface variables

PLC libraries

- Math: arithmetic, logic, bit operations, trigonometry
- Date and time operations
- String conversion and manipulation
- Function blocks: bi-stable, edge detection, counter, timer
- Access to Kithara API functions: shared memory, pipes, semaphores, events, callbacks, tracer messages, signal processing, task synchronization
- PLC application integrated into »RealTime Suite«
- Direct interaction between PLC programs and other real-time parts written in C/C++ or Delphi

Variable mapping

- Real-time access to EtherCAT topology
- Map variables with Kithara »Master Monitor« via XML
- PLC code refers to symbolic names independent of actual hardware configurations; map "master.slave.object.value" to symbolic names
- Assign variables in PLC on configuration level

Multi-tasking

- Preemptive real-time multi-tasking with priorities
- Task types: interval tasks, edge triggered tasks, continuous tasks, one time execution tasks
- Tasks on dedicated CPUs independent from Windows

Kithara PLC Compiler

- Compile and execute PLC projects
- Find PLC application errors and warnings
- Apply topology information
- Graphical user interface
- Install handlers for compiler and run-time errors/status
- Compile PLC sources: optimized, native machine code for Windows (32-bit & 64-bit)
- Import of several PLC source files
- Multi-threaded compilation

Operating systems:

- Windows 8 / 8.1 (32-bit & 64-bit)
- Windows 7 (32-bit & 64-bit)
- Windows Vista (32-bit)
- Windows XP (32-bit), >= SP 3
- Windows Server and Embedded versions also supported

Programming languages:

- C/C++, Delphi, C# and others
- access via COFF or OMF import library, ANSI C
- recommended: Microsoft® Visual Studio®/C++ 2010 or Embarcadero® C++Builder®

For the latest list of features, supported hardware, operating systems and programming languages, visit our web site at www.kithara.de.
We recommend downloading a test/evaluation version. Please contact us for any questions regarding your project!

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