

# Zynq Industrie 4.0 Reference Platform

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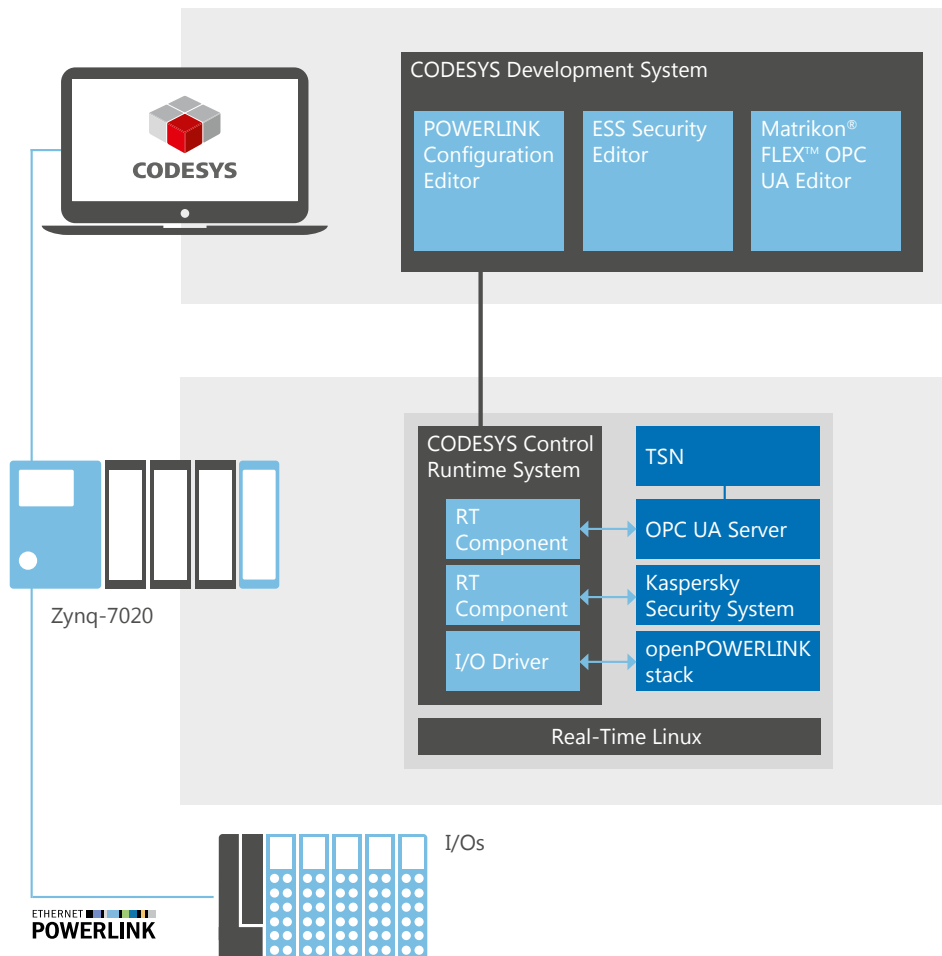


## Scope

In order to support and facilitate the migration to Industrie 4.0 & IIoT requirements, BE.services offers a software package, developed especially for the Xilinx Zynq-7000 All programmable SoC that brings key technologies for Industrial Control Systems. In the era of smart manufacturing, ICS are required to support real-time control execution, communication and connectivity to other equipment and software tools, yet solving cyber security risks. This software package contains all necessary technologies to comply with the requirements of the smart factory.

## Target Applications

- Factory Automation
- Process Automation
- Energy production and distribution
- Building Automation



## Functionality

- Real-time OS
- Industrial IEC 61131-3 controller on ARM Cortex A9
- Motion Control & CNC
- Visualization
- OPC UA with integrated configuration in CODESYS
- POWERLINK Master with integrated configuration in CODESYS
- TSN according to IEEE 802.1Qbv and IEEE802.1ASrev
- Integrated embedded security for communication channel
- High throughput AXI infrastructure for networking
- User expandable

## Features and benefits

### State of the art technology

Market leading companies and products ⇒ time saving in the selection process

### Complete integration

All software technologies used are integrated with each other ⇒ time and cost saving for the implementation

### Modular architecture

All technologies used remain independent from each other ⇒ freedom in the choice of products & solutions

### Full functional free evaluation version

The free evaluation version is only limited in time and can be relaunched indefinitely ⇒ time saving through extensive testing prior to the decision, cost reduction and simplification of the evaluation process

### Expertise for support and development

BE.services can be contracted for development, extension or integration services ⇒ time and cost saving through 3rd party expertise

## Software Package includes

- Embedded Software:
  - Real-time Linux (Kernel version 4.4.0) and OSADL RT-Preempt Patch
  - CODESYS Control Runtime System
  - Matrikon OPC UA server
  - Embedded Security Shield
  - openPOWERLINK Master stack
  - TSN Endpoint Ethernet MAC LogiCORE IP
- Development software:
  - CODESYS Development System V3
  - POWERLINK configuration plug-in for CODESYS
  - Security Configuration plug-in for CODESYS

## Engagement model

This evaluation software package is a bundle of key technologies and was prepared to ease the selection and evaluation of these different technologies. For integration in commercial products, the licenses for the rights to use each technology shall be received by the manufacturer or official distributor as follows:

How to get?

### 1. Embedded Software Technologies

Technology	Product	Manufacturer	Freeware	Sales Contact	License
Real-time Linux	RT Preempt Patch	OSADL <a href="http://www.osadl.org">www.osadl.org</a>	Yes	<a href="mailto:info@osadl.org">info@osadl.org</a>	Free
Control Logic Engine	CODESYS	CODESYS GmbH <a href="http://www.codesys.com">www.codesys.com</a>	No	<a href="mailto:info@codesys.com">info@codesys.com</a>	Yes (toolkit + license per device)
OPC UA Server	Matrikon OPC UA Embedded Server	MatrikonOPC <a href="http://www.matrikonopc.com">www.matrikonopc.com</a>	No	<a href="mailto:info@be-services.com">info@be-services.com</a>	Yes (toolkit + maintenance fee)
Cyber Security	Embedded Security Shield, powered by Kaspersky Lab	BE.services GmbH <a href="http://www.be-services.net">www.be-services.net</a>	No	<a href="mailto:info@be-services.com">info@be-services.com</a>	Yes (toolkit + license per device)
Fieldbus Master	POWERLINK	Ethernet POWERLINK Standardization Group <a href="http://www.ethernet-powerlink.com">www.ethernet-powerlink.com</a>	Yes	<a href="mailto:Info@ethernet-powerlink.org">Info@ethernet-powerlink.org</a>	No (license for integration in CODESYS)
TSN	TSN Endpoint Ethernet MAC LogiCORE IP	Xilinx, Inc <a href="http://www.xilinx.com">www.xilinx.com</a>	No	<a href="http://www.xilinx.com/about/contact/sales-reps.html">www.xilinx.com/about/contact/sales-reps.html</a>	Xilinx Core License Agreement applies <a href="http://www.xilinx.com/ipcenter/ip_license/ip_licensing.htm">www.xilinx.com/ipcenter/ip_license/ip_licensing.htm</a>

## 2. Development Tools

Technology	Product	Manufacturer	Freeware	Distribution	License
IEC 61131-3 development system	CODESYS	CODESYS GmbH www.codesys.com	Yes	store.codesys.com	Free
Fieldbus configuration	POWERLINK for CODESYS	BE.services GmbH www.be-services.com	Yes	store.codesys.com	Free
Embedded Security	Embedded Security Shield - Configurator	BE.services GmbH www.be-services.com	Yes	info@be-services.com	Free

## Technical data

Technology		Footprint	Communication	
CODESYS Control Runtime System	Minimum Recommended	16MB Flash/3MB RAM 64MB Flash/32MB RAM	Serial	✓
Matrikon OPC UA Server	Minimum Recommended	512kB Flash/100kB RAM 1MB Flash/2MB RAM	Ethernet	✓
POWERLINK Master	Recommended	2MB RAM	USB	✓
*TSN	FPGA LUTs BRAMs for scheduler, 3-port switch, 3 queue support 4096 CAM lookup, synchronization	~20k 72 (36kb each)	POWERLINK	✓

Supported platform: Zynq-7000

\*TSN requires Z-7020 or higher.

## Featured Manufacturers



## Evaluation Platform

### Hardware

ZC702 evaluation kit from Xilinx, Inc.. Included in this kit are ZC702 evaluation board, a full seat Vivado® Design Suite and all necessary tools and documentation to quickly prototyping embedded applications.



Get under: <http://em.avnet.com> and search for "ZC702"

### Software

Contact us and get your free evaluation of the complete software package.  
[info@be-services.com](mailto:info@be-services.com)

## Support

Please contact [info@be-services.com](mailto:info@be-services.com)