100% open technology
- no license fees
- no patents
- technology not owned by single persons or companies
- independence from ASIC providers
- open source software for masters and slaves

The EPSG will showcase the possibilities that allow manufacturers to easily and quickly equip their devices with POWERLINK interfaces. They have the choice between choosing existing products for the interface, or to implement it by themselves – a very simple task thanks to complete reference designs with no extra charge for license fees.
In any case, manufacturers can receive support from various service providers. Complete interface solutions and/or POWERLINK-related services are provided by renowned companies such as: Hilscher, Port, SYS TEC electronic, Kalycito, Deutschmann, IXXAT and B&R.
## POWERLINK Slave Implementation Overview

<table>
<thead>
<tr>
<th>Hardware technology</th>
<th>FPGA</th>
<th>FPGA</th>
<th>ARM and other CPUs/MCU's</th>
<th>Coldfire - System on Module</th>
<th>FPGA</th>
<th>netX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware type</td>
<td>Spartan3, Spartan6, Virtex4, Virtex5</td>
<td>Cyclone II, Cyclone III, Cyclone IV, Stratix3, Stratix4</td>
<td>e.g. STR9</td>
<td>MCF5484 with ColdFire V4e Core</td>
<td>Cyclone III</td>
<td>net50x/net100/1000</td>
</tr>
<tr>
<td>Hardware manufacturer</td>
<td>Xilinx</td>
<td>Altera</td>
<td>ST microelectronics</td>
<td>Freescale</td>
<td>Altera</td>
<td><a href="http://www.hilscher.com">www.hilscher.com</a></td>
</tr>
<tr>
<td>Solution provider</td>
<td>port</td>
<td>port.de</td>
<td></td>
<td>sys tec electronic GmbH</td>
<td><a href="http://www.port.de">www.port.de</a></td>
<td></td>
</tr>
<tr>
<td>Supported POWERLINK Version</td>
<td>DS 301 V1.1.0</td>
<td>DS 301 V1.1.0</td>
<td></td>
<td>DS 301 V1.1.0</td>
<td>DS V1.1.0</td>
<td></td>
</tr>
<tr>
<td>Multi Protocol support</td>
<td>POWERLINK, EtherNet/IP, EtherCAT, PROFINET, SERCOS III, Modbus TCP</td>
<td>POWERLINK</td>
<td></td>
<td>POWERLINK, SERCOS III, PROFINET RT, EtherCAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fastest supported Cycle time</td>
<td>application depending (typical 200µs)</td>
<td>application depending (typical 1 ms)</td>
<td>application depending (typical 400 µs)</td>
<td>application depending (typical 200µs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>μC Interface</td>
<td>DPRAM, PUDIn, serial (SPI), others on request</td>
<td>SPI, FlexBus on request</td>
<td>SPI, DPRAM on request</td>
<td>DP/RAM, serial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct I/O support</td>
<td>possible</td>
<td></td>
<td></td>
<td>optional IP cores for GPIO, SPI, ADC, PWM/PTO</td>
<td>Direct I/O Support: GPIO, PIO</td>
<td></td>
</tr>
<tr>
<td>Product highlights (max.)</td>
<td>Optimized for fast bus connection, fast cycle time and low resources, perfectly portable, up-to-date, comfortable dynamic object dictionaries</td>
<td>openPOWERLINK, user-programmable System On Module based on Linux</td>
<td>openPOWERLINK solution based on NIOS II Soft CPU, openMAC and openHUB, Customized Slave (CN) device development and implementation of communication coprocessors for existing devices</td>
<td>FPGAbased POWERLINK, for all major Communication Co-processors</td>
<td>Product highlights: Loadable Firmware, other options available on request</td>
<td></td>
</tr>
<tr>
<td>License Model</td>
<td>ANSI-C Source Code, Buyout, no royalties</td>
<td>openPOWERLINK Stack available under BSD License</td>
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</tr>
<tr>
<td>Company description</td>
<td>port - a leading Industrial Communication Specialist offers highly adaptable and portable protocol stacks for CAN and Industrial Ethernet, that are best suitable for Multisupport solutions on FPGA and CPU/MCU. Ports high performance DP-RAM interface PUDIn offer outstanding flexibility for multi protocol solutions as well as single protocol applications. Port offers Hardware and Software Engineering Services.</td>
<td>SYS TEC electronic GmbH specializes in developing and production of customer-tailored solutions for distributed automation and embedded communication.</td>
<td>SYS TEC electronic GmbH specializes in developing and production of customer-tailored solutions for distributed automation and embedded communication.</td>
<td>Hilscher provides products, technologies and services for industrial communication</td>
<td></td>
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<td>Solution provider</td>
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<td>sys tec electronic GmbH</td>
<td></td>
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<td>hilscher GmbH</td>
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</tr>
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<td>0049 (0)3661 62790</td>
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<td>0049 (0)691 9807-0</td>
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</tr>
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<td>e-Mail</td>
<td><a href="mailto:service@port.de">service@port.de</a></td>
<td><a href="mailto:info@sys-tec-electronic.com">info@sys-tec-electronic.com</a></td>
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<td></td>
<td><a href="mailto:info@hilscher.com">info@hilscher.com</a></td>
<td></td>
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</tbody>
</table>
### Product Highlights

- **Optimized for fast bus connection, fast cycle time and low resources.**
- **Direct I/O support possible.**
- **µC Interface DPRAM, PUDIn, serial (SPI), others on request.**
- **SPI, FlexBus on request.**
- **DP/RAM, serial.**
- **Fastest supported Cycle time application depending (typical 200µs).**
- **Multi Protocol support: POWERLINK, EtherNet/IP, EtherCAT, PROFINET, SERCOS III, Modbus TCP.**
- **Supported POWERLINK Version DS 301 V1.1.0.**

### Fieldbus and Industrial

- **Fieldbus and Industrial communication.**
- **UNIGATE IC is available for all major Fieldbuses and Industrial Ethernet - same Pinout.**
- **application depending (typical 1ms).**
- **Serial: DPRAM, serial or parallel.**
- **optional CAN, Digital I/O, Analog I/O.**
- **Optional digital I/O, CAN, serial.**
- **32 latched digital I/Os.**

### Software

- **Free programming user interface via script commands. Also available for "DesignIn".**
- **Co-Processor module. Common multi-protocol host API.**
- **High performance MN or CN solution for custom-specific Design-in solutions.**
- **MN-CN protocol support with flexible use of the software. Part to other CPUs possible.**
- **Design-in of multi-protocol module solution for custom-specific factors.**
- **POWERLINK-only CN design-in. Software API allows variable integration of application or host interfaces.**

### License

- **"DesignIn" Single device Royalty Buyout Royalty Buyout Buyout.**
- **Hilscher provides products, technologies and services for industrial communication.**
- **IXXAT is a leading supplier for POWERLINK and Industrial Ethernet HW and SW solutions.**
- **B&R is a leading manufacturer of components and complete solutions for industrial automation.**

### Company Details

- **IXXAT Automation GmbH**
- **www.ixxat.com**
- **www.ethercat-powerlink.org**
- **E-Mail: info@ethercat-powerlink.org**
- **Phone: +49.30.85 08 85 - 29**
POWERLINK Slaves can be implemented as various models which differ with regard to cost and flexibility. Customers can thus choose the optimal solution for their requirements, combining maximum functionality with minimal costs. POWERLINK interface connections can be realized as multi-protocol solutions and as POWERLINK-only interfaces.

The first option allows for high flexibility: the component manufacturer must decide on a specific hardware platform and yet need not choose the Industrial Ethernet bus of the module until it is delivered. In the second option, all electronics can be optimized for the resource-saving POWERLINK technology, allowing users to implement a high-performance, very cost-efficient Industrial Ethernet interface.

Since both options are based on standard hardware components (FPGAs or system-on-a-chip solutions), customers can freely choose their hardware supplier. No matter which option is chosen: POWERLINK is always a future-proof investment.