



# POWERLINK

## Slave Implementation Overview







### 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.

ETHERNET   
**POWERLINK**

## POWERLINK Slave Implementation Overview






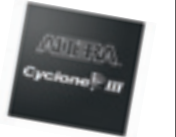


						
Hardware technology	FPGA	FPGA	ARM and other CPUs/MCUs	Coldfire – System on Module	FPGA	netX
Hardware type	Spartan3, Spartan6, Virtex4, Virtex5	Cyclone II, Cyclone III, Cyclone IV, Stratix3, Stratix4	e.g. STR9	MCF5484 with ColdFire V4e Core	Cyclone III	netX50/netX100/netX500
Hardware manufacturer	Xilinx www.xilinx.com	Altera www.altera.com	ST microelectronics www.st.com	Freescale www.freescale.com	Altera www.altera.com	www.hilscher.com
Solution provider	port www.port.de			SYS TEC electronic GmbH www.systec-electronic.com		www.hilscher.com
Supported POWERLINK Version	DS 301 V1.1.0			DS 301 V1.1.0		DS V1.1.0
Multi Protocol support	POWERLINK, EtherNet/IP, EtherCAT, PROFINET, SERCOS III, Modbus TCP			POWERLINK		POWERLINK, SERCOS III, Profinet RT, EtherCAT
Fastest supported Cycle time	application depending (typical 200µs)			application depending (typical 1 ms)	application depending (typical 400 µs)	application depending (typical 200µs)
µC Interface	DPRAM, PUDIn, serial (SPI), others on request			SPI, FlexBus on request	SPI, DPRAM on request	DP/RAM, serial
Direct I/O support	possible			24 GPIs, 22 GPOs, extendible via on-board CPLD, SPI and I2C	optional IP cores for GPIO, SPI, ADC, PWM/PTO	Direct I/O Support: GPIO, PIO
Product highlights (max.)	Optimized for fast bus connection, fast cycle time and low resources, perfectly portable, up-to-date, comfortable dynamic object dictionaries			openPOWERLINK Reference Kit, user-programmable System On Module based on Linux	FPGA-based POWERLINK solution based on NIOS II Soft CPU, openMAC and openHUB. Customized Slave (CN) device development and implementation of communication co-processors for existing devices	Product highlights: Loadable Firmware, other options available on request
License Model	ANSI-C Source Code, Buyout, no royalties			openPOWERLINK Stack available under BSD License		Slave Stack license is included with chip (netX Basis Support Agreement or netX Technology User Agreement required)
Company description	port - a leading Industrial Communication Specialist offers highly adaptable and portable protocol stacks for CAN and Industrial Ethernet, that are best suitable for Multiprotocol Solutions on FPGA and CPU/MCU. Ports high performance DP-RAM Interface PUDIn offers outstanding flexibility for multi protocol solutions as well as single protocol applications. Port offers Hardware and Software Engineering Services.			SYS TEC electronic GmbH specializes in developing and production of customer-tailored solutions for distributed automation and embedded communication.		Hilscher provides products, technologies and services for industrial communication
Solution provider	port GmbH			SYS TEC electronic GmbH		Hilscher GmbH
Contact details	Regensburger Str. 7b 06132 Halle/Saale Germany			August-Bebel Str. 29 07973 Greiz Germany		Rheinstrasse 15 65795 Hattersheim Germany
Phone	+49 (0) 345 777550			0049 (0)3661 62790		0049 (0)6190 9907-0
e-Mail	service@port.de			info@systec-electronic.com		info@hilscher.com
Homepage	www.port.de			www.systec-electronic.com		www.hilscher.com

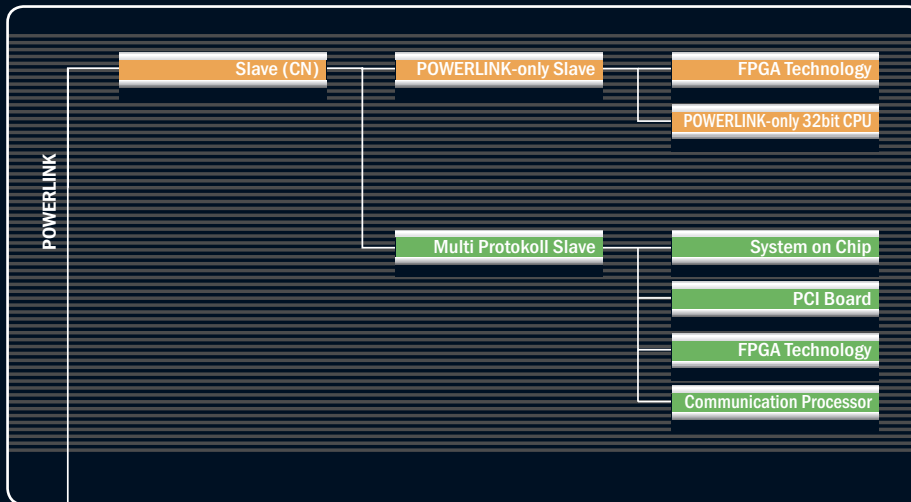
**POWERLINK OFFICE of the EPSG**

www.ethernet-powerlink.org

E-Mail: info@ethernet-powerlink.org

Phone: +49 . 30 . 85 08 85 - 29

							
32 Bit µC	FPGA	FPGA	Coldfire	FPGA	FPGA	FPGA	FPGA
HyNet 32 S	Cyclone III above C16	Cyclone II C20	MCF 523x	Cyclone III above C16, other on request	Cyclone III above C10, other on request	Cyclone IV (4CE6 or above)	Spartan6 (SLX9 or above)
Hyperstone www.hyperstone.com	IXXAT	Altera www.altera.com	Freescale www.freescale.com	Altera www.altera.com	Altera www.altera.com	Altera www.altera.com	Xilinx www.xilinx.com
Deutschmann Automation www.deutschmann.de	IXXAT Automation GmbH www.ixxat.com					B&R www.br-automation.com	
DS 301 V1.1.0	DS 301 V1.1.0					DS 301 V1.1.0	
UNIGATE IC is available for all major Fieldbuses and Industrial Ethernet - same Pinout	POWERLINK, PROFINET, EtherCAT, Ethernet/IP, SERCOS III, Modbus	POWERLINK	POWERLINK, any other real-Time Ethernet-Protocol available	POWERLINK, PROFINET, EtherCAT, Ethernet/IP, SERCOS III, Modbus	POWERLINK	POWERLINK	
application depending (typical 1ms)	application depending (typical < 400µs)	application depending (typical 200µs)	application depending (typical 500µs)	application depending (typical 400µs)	application depending (typical 400µs)	application depending (typical 200µs)	
Serial	DPRAM, serial or parallel	DPRAM, PCI	serial, Shared-Memory	DPRAM, serial or parallel, others on request	Optional DPRAM	8/ 16 bit parallel or SPI via DPRAM	
Expandable via synchronous-serial interface for stand alone operation, shift register connection, analog/digital converters etc.		optional	CAN, Digital I/O, Analog I/O	Optional digital I/O	Optional digital I/O, CAN, serial	32 latched digital I/Os	
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. Port to other CPUs possible	Design-in of multi-protocol module solution for custom-specific form factors	POWERLINK-only CN design-in. Software API allows variable integration of application or host interfaces.	Design-in of POWERLINK slave	
"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.	
Deutschmann Automation GmbH	IXXAT Automation GmbH					Bernecker + Rainer Industrie-Elektronik Ges.m.b.H.	
Carl-Zeiss-Str. 8 65520 Bad Camberg Germany	Leibnizstraße 15 88250 Weingarten Germany					B&R Straße 1 5142 Eggelsberg Austria	
0049 (0)6434 9433-0	0049 (0)751 56146-0					+43 7748 6586 0	
vertrieb@deutschmann.de	info@ixxat.de					office@br-automation.com	
www.deutschmann.de	www.ixxat.de					www.br-automation.com	



POWERLINK Slave models

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.

ETHERNET   
**POWERLINK**

**POWERLINK OFFICE of the EPSG**  
 Schaperstraße 18  
 10719 Berlin · Germany

Phone: +49 . 30 . 85 08 85 - 29

Fax: +49 . 30 . 85 08 85 - 86

E-Mail: [info@ethernet-powerlink.org](mailto:info@ethernet-powerlink.org)