

The openPOWERLINK protocol stack by SYS TEC electronic provides all functions and services required for implementing controlled nodes (CN) and managing nodes (MN) according to the Ethernet POWERLINK specification EPSG DS 301 V1.1.0. To assist you in developing your POWERLINK-enabled product we provide plenty of services as well as platform specific porting.

Fully EPSG DS 301 V1.1.0-compliant scope of functions

Modular and performance-optimized software structure

Comprehensive configuration and scaling options

Simplified API to the user application

Operating system independent

Implemented in ANSI-C



ETHERNET 
POWERLINK

The openPOWERLINK protocol stack is available as a generic source code version that allows for an easy porting to various target and operating systems. The stack is released under BSD license, that allows for using openPOWERLINK without extra fees or license cost. The software provides all mandatory functions of the Ethernet POWERLINK specification version 2.0 as well as various optional functionalities. For instant startup, openPOWERLINK is available as LiveCD for Windows and Linux.

With the source code comes also an insert-ready kernel modules and application code to run the stack directly under Linux on reference systems provided by SYS TEC. This provides a good entry point for a quick and easy start of your own development.

Maximum degree of interoperability

Our openPOWERLINK implementation has gone through extensive testing procedures with other POWERLINK devices of various suppliers, to ensure a stable platform and a high degree of interoperability.

The protocol stack software is organized and implemented in functional modules, providing a best flexibility and scalability, yet keeping the focus on serving the timing requirements.

Real-time handling

All hardware-specific and time-critical functionality of the openPOWERLINK software were designed and optimized to guarantee fast response time of real-time events on the POWERLINK-bus. Therefore, the access and the handling of the Ethernet controller is encapsulated within a separate driver module.

Assisting you with openPOWERLINK

To assist you in developing your POWERLINK-enabled product we provide plenty of services. This may start with trainings and adaptation workshops. The training may contain the following topics:

- Introduction into POWERLINK & openPOWERLINK with API
- Commissioning of the openPOWERLINK Development Kit
- Setting up a Reference-Application as master and slave node
- Further topics on request

Please see the backside of this flyer for further support information.

Customized implementation

We implement the driver for your specific Ethernet controller. Further development may include (but is not limited to):

- Adaptation of openPOWERLINK to your target platform
- Application software development
- FPGA and hardware development
- Implementation of a SPI or DPRAM interface
- Assistance with preparation and accomplishment of conformance test of your POWERLINK-device

About SYS TEC electronic

SYS TEC electronic GmbH is a system house for distributed automation technology. We provide a comprehensive service from consulting to OEM integration.

Founded in 1990 in Germany SYS TEC electronic has more than 20 years experience in customized development of microcontroller systems and industrial communication.

Customized Services & Professional Support

As the designer of the openPOWERLINK protocol stack, we provide professional services and support, i.e. for OS-specific adaptations or the development of customized extensions. Our services range from consulting, specification, hardware and software development up to prototyping and serial production in our own production facility - ALL FROM ONE SOURCE!

Our individual workshops offers a professional and efficient introduction to openPOWERLINK for you and your team! Due to our long-term practical experience, we are the ideal partner in the area of openPOWERLINK. During the workshop you will get a general overview, hardware-related knowledge and practical skills needed for adapting the openPOWERLINK software-stack to your target platform. Based on existing reference applications, our experts will explain the effective porting on high-performance hardware platforms.

openPOWERLINK LiveCD

Based on our openPOWERLINK protocol stack, the SYS TEC openPOWERLINK LiveCD is a ready-to-run managing node on a bootable CD. Simply connect one or more controlled nodes to a PC with a Realtek RTL81139-based network card and boot from the LiveCD. Follow the steps shown on the screen and you will have your own POWERLINK network up and running in 5 minutes. The LiveCD does not need installation. It provides full openPOWERLINK functionality without altering your harddisk. An ISO image of the LiveCD is available for free download.



Free download:

www.systec-electronic.com/openpowerlink_livecd

openPOWERLINK Development Kit

Accelerate your Ethernet POWERLINK development with a pre-configured SYS TEC electronic openPOWERLINK Development Kit. It contains all hardware and software components required for trouble-free entry into Ethernet POWERLINK, a number of sample applications, comprehensive documentation and debug tools. According to the different needs of the market we offer different versions of our openPOWERLINK Development Kit:

openPOWERLINK for FPGA Development Kit

The openPOWERLINK for FPGA Development Kit is a low-cost, high-performance method for startup into the Ethernet POWERLINK technology based on the ALTERA Cyclone EP3C FPGA and ECUcore-EP3C System on Module (SOM). The FPGA on the ECUcore-EP3C is preprogrammed with a stand-alone openPOWERLINK demo application running on a NIOS II Soft CPU. Besides the Soft CPU the FPGA configuration includes a seamlessly integrated openMAC, openHUB and the required system peripherals. The demo application achieves a POWERLINK timing of 400 μ s cycle time, about 1 μ s Poll Response latency and less than 1 μ s synchronization jitter.

openPOWERLINK Linux Starter Kit

Based on our ECUcore-5484 single board computer with pre-programmed Linux-OS, the Kit also includes a fully functional EPL stack with a MN as well as a CN application. The development board features the typical POWERLINK hub to support simple daisy chain connections between the nodes.



Functional Overview

openPOWERLINK Protocol Stack

Ethernet POWERLINK API layer

The openPOWERLINK API layer defines a simplified application programmer's interface (API) to perform tasks required to operate the stack (e.g. initialization).

Communication Abstraction layer

The openPOWERLINK protocol stack is divided into a hard-realtime task that processes cyclic events and a low-priority task that is responsible for asynchronous events like SDO processing. The communication between these tasks is encapsulated in the event-based Communication Abstraction layer. To run openPOWERLINK on a new platform, you only need to adapt the Communication Abstraction layer itself, while the rest of the stack sources are kept untouched.

Process Data Object (PDO)

Process Data Objects are used to exchange data between nodes in the POWERLINK network. When integrating the device into the network, data that is transmitted and received has to be mapped to PDOs in the Object Dictionary. This PDO mapping can be changed dynamically by the application or via SDO transfers. POWERLINK transmits PDOs cyclically.

Object Dictionary and Service Data Object (SDO)

The stack supports SDO via UDP and asynchronous EPL frames (so-called "ASnd frames"). It uses a standard UDP/IP stack for SDO communication via UDP, e.g. the one supplied by your operating system or a separate stand-alone UDP/IP stack.

Process Data Object (PDO)

The openPOWERLINK source code supports the implementation of managing nodes (MN). The Configuration Manager configures each controlled node according to a supplied device configuration file.

Ordering Information

Service-06	openPOWERLINK BASIC Support
Service-05	openPOWERLINK PREMIUM Support
5003003	openPOWERLINK Workshop
KIT-154	openPOWERLINK Linux Starter Kit
KIT-161	openPOWERLINK Development Kit ECUcore-EP3C

For quotations please contact us:

+49 3765 38600-2110 | sales@systec-electronic.com