NEWS

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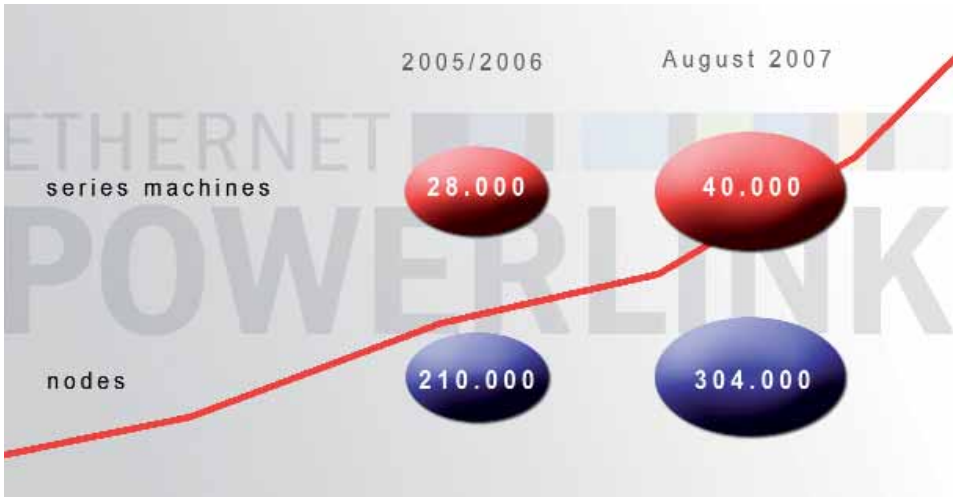
POWERLINK: 40,000 series machines and 304,000 nodes in use worldwide

The EPSG has published current research data on the number of POWERLINK series machines and nodes in operation around the world. While the most recent previous count had totaled 28,000 series machines and 210,000 nodes in operation, the number of series machines has risen to 40,000 over the course of the last few months, with nodes now amounting to 304,000.



POWERLINK workshops for developers, end users and sales staff

The EPSG now offers a number of POWERLINK training workshops to meet the information needs of decision makers, developers, end users and sales staff. The courses are designed to take from one to three days. Contents covered will vary for different workshops. Topics include an introduction to the basics of the technology, hands-on instructions for implementations, system diagnosis know-how, and communication training for sales specialists regarding POWERLINK's key strengths. The workshop lineup will kick off with a sales training event on October 15 of this year, where EPSG sales experts Stefan Schönegger and Rüdiger Eikmeier will point out the workings of POWERLINK, highlight the added benefits for customers and end users, and also give an overview of competing products. The venue for this course will be the Mövenpick Airport Restaurant at Nuremberg.

Please contact the EPSG Office to sign up if you are interested in participation.

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Learn to POWERLINK with *port's* StarterKit

A StarterKit available from *port* GmbH, a specialist for CAN and Ethernet-based fieldbus systems, enables users to get acquainted with both the POWERLINK protocol and the hardware implementation of a POWERLINK node, but spares them the need for major initial investments, a substantial training effort etc.

Figure: Quick route to POWERLINK: *port's* StarterKit

port's POWERLINK StarterKit contains all the soft- and hardware users need. The POWERLINK Device Monitor tool, Managing Node software for the POWERLINK interface, and POWERLINK Analyser for Windows and Linux make up the software part of the kit. The hardware package comprises a POWERLINK Managing Node as well as the target hardware platform for developing a Controlled Node, complete with the SDK and sample code. The target platform comes in the form of a XILINX Spartan 3E board sporting a XILINX Spartan 3E-500 FPGA. However, the StarterKit is also suitable for other standard hardware, and can be supplied e.g. with 16 bit controllers such as the Freescale NE64 with an onboard Ethernet PHY, or 32 bit controllers like the ST Microelectronics ARM9 ST910/ST912, or a MicroBlaze CPU on a XILINX FPGA. A POWERLINK hub, power supply and Ethernet cable are also included in delivery. Kits which also carry a demo version of the POWERLINK EPL-Report Analyser are optionally available. Users who choose this option will need a second POWERLINK interface.

For the standard version of the StarterKit, a laptop is the only extra equipment that is needed. A POWERLINK network consists of a Managing Node and at least one Controlled Node. The MN is the central controller for all data communications,

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while the CNs represent applications on the network. The Kit's combination of the Managing Node software and port's POWERLINK Device Monitor software gives users a full-fledged Managing Node with comprehensive network management and communication functions. POWERLINK Device Monitor features an intuitive user interface with comfortable access to control functions. Process signals can be simulated and indicated by LEDs on Controlled Nodes. Since POWERLINK uses CANopen mechanisms, the target hardware responds like any CiA-standard compliant I/O device.

Users who require more information on port's StarterKit and on the POWERLINK standard will find up-to-date information on the internet at www.epl-tools.com.

Two become one: CANopen and POWERLINK

As networks grow larger and data traffic load increases, CANopen communication is increasingly impeded, since the underlying CAN transport protocol has a maximum bandwidth of 1 Mbit/s and merely allows for a 25 m line length between two nodes. POWERLINK users, on the other hand, have CANopen's advantages at their disposal even in extensive networks and with far greater traffic load, because the real-time Ethernet protocol's application layer uses CANopen mechanisms.

Figure: POWERLINK is CANopen's successor. The interoperable protocols allow for resource-saving migrations.

For the application, there is no difference between CANopen and POWERLINK. However, the latter has a bandwidth of 100 Mbit/s and allows for a maximum line length of 100 m between two network nodes. Basically, there are two POWERLINK application scenarios in which CAN fieldbus users can equally profit from CANopen

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Two become one: CANopen and POWERLINK

and Ethernet advantages: either a migration from CANopen to POWERLINK or a combination of CANopen and POWERLINK network segments via POWERLINK/CANopen gateways. Where migration is not cost-efficient, a subdivision of the network into main segments and subsystems is a suitable alternative. This approach allows for two architectures, integrating either CAN subsystems into a higher-level POWERLINK network or POWERLINK subsystems into a CAN network. The former is an ideal solution for e.g. remote activation of local applications from a large distance, the latter is ideal for local applications requiring high internal bandwidth, such as measuring equipment which processes large amounts of data.

The full-fledged integration of CANopen mechanisms is testament to the fact that the EPSG has based its communication solution on a tried and proven system, and enables the implementation of state-of-the-art network infrastructures. Users can continue to rely on CANopen's advantages while also exploiting Ethernet's benefits. Hence, in terms of technology, but also regarding the open format, POWERLINK is the legitimate successor to CANopen.

Alstom develops POWERLINK-based redundant fieldbus solution

Alstom, a company globally active in the energy and transport industries, has developed a POWERLINK-based fieldbus system suitable for redundant layouts which features minimal reaction times, real-time synchronization, high bandwidth and easy diagnosis options. High availability is essential in process industry applications. Essential applications must be secured, preventing functional disruptions in case of control hardware failures or cable damage.

Alstom was looking for a new, redundant fieldbus combining real-time capability and high bandwidth, since a greatly increased data amount in process technology applications had exceeded the performance capability of Alstom's old fieldbus (Factory Implementation Protocol). POWERLINK, originally developed by B&R, was the solution of joice. A protocol extension of the Ethernet standard, it allows for real-time data transfer at the microsecond level. POWERLINK networks provide real-time behavior thanks to a central control processor, a so-called Managing Node, which coordinates data traffic. In order to integrate several Managing Nodes into the network for redundant layouts, Alstom's developers needed to modify the protocol. In doing so, they greatly benefited from the openness of the POWERLINK standard and transparency within the user organization Ethernet Powerlink Stan-

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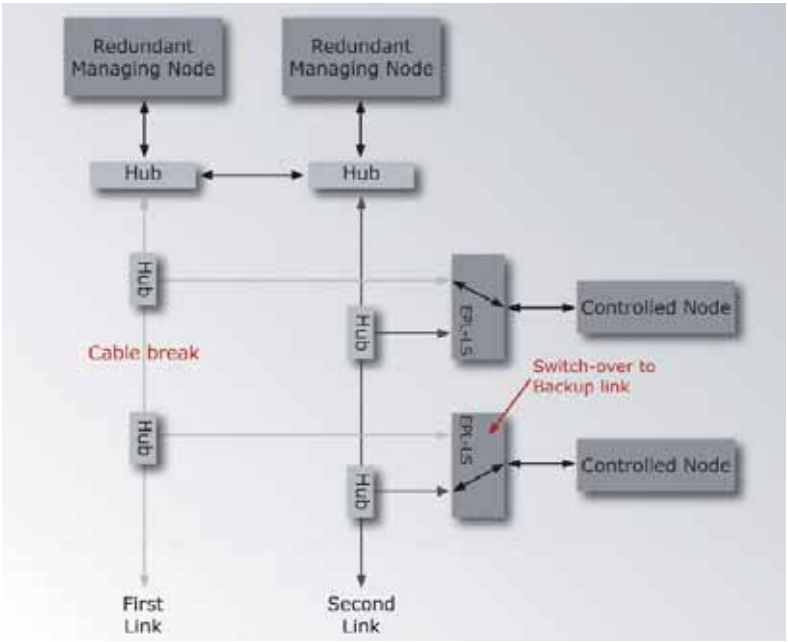

Figure: Alstom's network layout: redundant Managing Nodes, redundant data cables and Link Selectors ensure high availability

dardization Group (EPSG). "Exchanging knowledge and cooperating with other groups working in this field provided many advantages. We have full access to all resources," comments Stéphane Potier, project manager at Alstom. Moreover, Alstom's network also features redundant data lines. The link selector is another innovation by Alstom's specialists: similar to a hub, it connects the inputs of redundant data lines with the nodes. If one line is interrupted, it switches to the "spare" and reports the location of the network interruption. Alstom went through an intense testing and simulation phase before the network was put into operation. The developers are now very much satisfied with the result: "The system has a very clear layout, another advantage is its hot-plugging support. Moreover, we could easily integrate the network configuration into our engineering tool, since POWERLINK is based on CANopen," concludes Potier. Furthermore, the whole community profits from the development: The new functionalities will be standardized within the EPSG and are open to everyone.

The full version of the report on the deployment of the high availability POWERLINK solution at Alstom is available at www.ethernet-powerlink.org in the "news & events" section.

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Gigaspeed: POWERLINK achieves tenfold increase in performance

Ensuring real-time data exchange at 1000 Mbit/s and featuring integrated safety technology, POWERLINK sets a new benchmark for real-time communication systems. The new Gigabit Ethernet network standard provides a ten times higher transfer rate than the speeds implemented or roadmapped for other real-time Ethernet variants. Moreover, POWERLINK allows users easy access to the high-speed bus. Only the hardware platform made up of standard modules needs to be exchanged. POWERLINK safety solutions also benefit greatly from the increased performance, since the safety protocol was developed from the start based on the higher data transfer rate. Application examples include plants with a high production output which incorporate numerous modular control systems and drives and completely integrated safety technology. The Ethernet POWERLINK Standardization Group is convinced that while current transfer rates of existing systems may be sufficient for most applications, Gigabit technology will bring about long-term effects such as a higher output and a more exact synchronization of all processes involved in production. Gigabit Ethernet provides a perspective for the next ten years. "We implement this advance in information technology quickly and seamlessly, using standard modules," comments EPSG chairman Dr Edwin Kiel.

Figure: In the fast lane: Gigabit Ethernet ensures real-time data exchange at 1000 Mbit/s