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The Real–Time Ethernet Magazine

SERCOS III on a course of expansion:
Semiconductor production and fluid technologies rely on open standard

SERCOS inside: First SERCOS III Conformance Test Certificates issued

Product-News: RZA-Ethernet Monitor – A powerful tool for analysis

Application: Virtual machine on the SERCOS real-time bus

|||SERCOS
interface

Virtual worlds on a real bus

Virtual worlds are taking up an increasing amount of our daily lives thanks to modern computer science. For science and engineering, these worlds offer answers to questions which would be difficult or completely impossible to answer in reality. The aim of making the unknown virtually known or gaining a virtual insight into the future is motivating scientists and engineers to develop methods which should allow them to gain answers to the unsolved questions using simulations. In industrial practice, this means virtually creating a product, optimizing it, putting it into operation and monitoring it in the operational phase. The numerous reports of success from research and engineering show how advanced this already is today. The use of simulation methods in the context of real hardware can be established through real-time simulation in automation technology.

Today Hardware-in-the-Loop Simulation is being particularly successfully used for implementing controller systems. Early testing of controller functions and programs allows reduced implementation times on the actual plant floor with a high test depth of the controller software. This requires the simulation to produce an exact illustration of the I/O behavior on the actual bus system. Not only short cycle times must be observed here, but realistic actual values must be calculated against given set points. In complex production processes, this leads to high demands on the simulation models which could previously only be partially fulfilled. Today, the interaction between the machine dynamics, drive control and controller can be simulated well in real-time. The simulation of the processes, however, does additionally require the process dynamics to be considered, which still represents an unsolved problem for real-time simulation for many production processes. In turn, this is motivating scientists at the Institute for Control Engineering for Machine Tools and Manufacturing Units at the University of Stuttgart (ISW) to design methods which should take production processes into consideration in a Hardware-in-the-Loop Simulation in the future.

Enjoy reading!

Jun.-Prof. Dr.-Ing. Sascha Röck,
ISW, University of Stuttgart

Quick-Info 1-1001 ▲

Rexroth
Bosch Group

New applications: Now, also manufacturers of machines for the semiconductor industry are relying on SERCOS III.

SERCOS III on a course of expansion: Semiconductor production and fluid technologies rely on open standard

The conversion from the pure drive communication in the first SERCOS interface generation to the real-time-enabled SERCOS III has made clear progress. Currently, new applications in the semiconductor industry document the flexibility and performance of this open standard. Simultaneously, new SERCOS III interfaces for hydraulic and pneumatic actuators open up the advantages of Ethernet real-time communication for all drive technologies.

Whether it is about the highest precision, the synchronization of several hundred axes or the greatest flexibility possible for ever smaller batch sizes, SERCOS has proven its worth for many years, setting benchmarks in the machine tool, printing and packaging industries. Now, the first manufacturers of machines for the semiconductor industry are using SERCOS III for innovative concepts. For example: Smart Equipment Technology SAS, SET, with the new FC 300 for different front-end and back-end process steps in the chip production. In this connection, the French manufacturer relies on the Rexroth NYCe 4000 Motion Control and SERCOS III as a universal bus. The Rexroth NYCe 4000 Motion Control especially optimized for the semiconductor and solar industry, integrates the entire control and drive hardware in one housing and requires less space than an industrial PC. The open software architecture offers extremely high flexibility in the automation of modules and complete machines. It coordinates up to ten linear, piezo, stepper, servo synchronous or torque motors.

In semiconductor processes, process reliability plays a particularly important role. In contrast to most other industrial production processes, semiconductor production requires many process steps under vacuum or under protective gas. That is why automation solutions must simultaneously record and analyze many sensor

signals in real-time and react accordingly. This is reflected in the NYCe 4000 by connection possibilities for up to 120 digital and analog I/Os. In the complex processing steps, SERCOS III – as an Ethernet-based real-time communication – guarantees the highest process reliability. Apart from the real-time mechanisms proved million times over plus a broad range, SERCOS III offers high noise immunity.

Intelligent hydraulics and pneumatics

In addition to electric actuators, SERCOS III is also supported by an increasing number of other drive technologies. The Rexroth HNC Motion Control for hydraulic feed axes closes the control circuit in a decentralized fashion and thus separates the hydraulic system from the automation. For the control, the axis behaves like an electric drive as the motion control automatically compensates the particularities of the fluid technology. Connected via SERCOS III, these electrohydraulic axes achieve very high dynamics and a precision that is only limited by the sensors' resolution.

Rexroth also offers the SERCOS III interface for pneumatic systems. Via SERCOS III bus modules, the control communicates directly with valve support systems in which up to 32 valve coils are activated. In protection class IP 65, the manufacturer completely integrates the control in the CD01/02-PI, HF02/03-LG and HF04 valve support series that each cover a broad

Universal bus: Rexroth's BDC bus module for pneumatic valve support systems with SERCOS III interface.

range of applications. Both the electric and pneumatic connections are oriented in the same direction and thus minimize the installation space for the weight-optimized valve unit. User-friendly configurators allow users to simply and efficiently compile the valve support systems including bus control. The universal system offers numerous possibilities like the

flexible addressing of individual participants or the realization of different electrical emergency stop circuits.

The examples show that SERCOS is on a course of expansion

More and more machine manufacturers from numerous industries are using SERCOS III for the first time and in this way are proving its universal applicability. This development is supported by many control and drive manufacturers like Rexroth via an ever-growing number of SERCOS-compatible controls and drives of all technologies.

Contact:
Bosch Rexroth AG
Corporate Communications
Chantal van Mierlo
Phone: +49 (0) 9352 / 18-1573
Fax: +49 (0) 9352 / 18-1812
chantal.vanmierlo@boschrexroth.de
www.boschrexroth.com

Quick-Info 1–1002 ▲

Any device with an Ethernet interface can be connected to a SERCOS III port without any additional hardware or software.

|||SERCOS interface

What all have Real-time Ethernet Communications.

Only SERCOS has Plug-and-play-standardized and non-proprietary.

SERCOS III – the independent real-time high-performance fieldbus.
Our customers deservedly expect only the very best solutions for drive and control technology. The core for such solutions is a comprehensive communication system. This is why we actively support the development of SERCOS III. It incorporates two standards: the proven real-time mechanisms and the internationally established Ethernet technology.
Bosch Rexroth. The Drive & Control Company

Rexroth
Bosch Group

Bosch Rexroth AG
www.boschrexroth.com/sercos

IXXAT

Industrial Ethernet Module for an easy connection to SERCOS III

Using IXXAT's Industrial Ethernet Module (IEM), devices can be connected quickly and cost-efficiently to SERCOS III networks.

The IEM is based on a powerful Altera Cyclone III FPGA which includes an integrated 32bit CPU and Ethernet controllers, the PHYs, magnetic modules and RJ45 jacks.

The IEM is equipped with two Ethernet interfaces allowing easy set up of line as well as ring topologies by using the integrated switch or hub. The connection to the host system is made either memory mapped or via SPI. In addition to SERCOS III, the IEM also supports POWERLINK, PROFINET, EtherNet/IP, EtherCAT and Modbus-TCP. For development and testing, IXXAT supports the module with an evaluation kit, inclu-

ding the IEM, a carrier board, a CPU module together with an adapter board and the Host API together with programming examples in source code.

The form factor of the IEM has been chosen with utmost care to meet most of the customer's requirements. However, if the form factor of the Industrial Ethernet Module is not suitable for integration into the customer's device, IXXAT also offers a customer-specific modification and a design-in solution. Furthermore, IXXAT also offers the development of customized solutions on a project basis. The continuous development of the

module in combination with a common API minimizes the investment risk and ensures the customer's long-term investment.

Contact:
IXXAT Automation GmbH
Frank Pastors
Leibnizstr. 15, D-88250 Weingarten
Phone: +49 (0) 7 51 / 5 61 46-111
Fax: +49 (0) 7 51 / 5 61 46-29
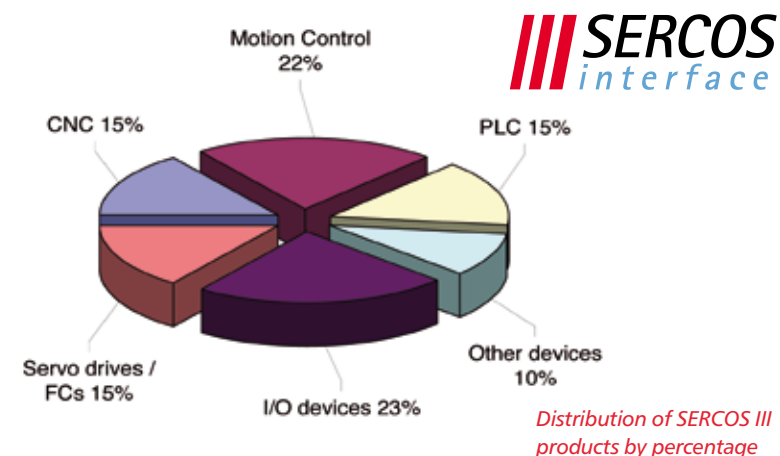pastors@ixxat.de
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Quick-Info 1-1003 ▲

SERCOS *interface*

AUTOMATA
a Cannon company

Control- and IO-Systems ◄
Hardware components ◄
Communication stacks ◄
SoPC designs for various FPGAs ◄
Design - Consulting - Training ◄

Realtime-Ethernet on proven base

Distribution of SERCOS III products by percentage

SERCOS *interface*

Fast-growing range of SERCOS III products and manufacturers

Over 100 SERCOS III products and components are currently offered from more than 40 manufacturers. These products cover a broad range:

• complete automation solutions (package of controls, drives and/or I/O peripherals)
• automation devices (control systems, drives, I/O devices, other devices such as sensors)
• tools (development, configuration, diagnosis)
• hardware and software components (controllers, drivers, stacks)
• active and passive infrastructure components (switches, cables, plugs)

In addition, several innovative products are offered that support the integration of non-SERCOS III devices into a SERCOS III network. Examples of such products are:

• real-time switches to interconnect SERCOS III and Ethernet networks
• gateways to interconnect SERCOS III and other fieldbuses or RTE networks
• axis control modules that allow the connection between analogue axes and SERCOS III networks
• modular I/O systems for SERCOS III that offer a broad range of functions and interfaces

More than a dozen service providers offer consultation and support for device manufacturers that do not intend to develop and integrate a SERCOS III interface completely on their own.

The range of services covers development support, training, consultation, testing and even certification of SERCOS III devices.

Contact:
SERCOS International e.V.
Küblerstraße 1, D-73079 Süßen
Phone: +49 (0) 7162/9468-65
Fax: +49 (0) 7162/9468-66
www.sercos.de

Quick-Info 1-1004 ▲

SAFE WIRING

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Application   9

Examples of simulation models in a Hardware-in-the-Loop Simulation

Virtual machine on the SERCOS real-time bus

The implementation of machines and systems consumes a significant amount of time in the product development process. In this respect, the commissioner is forced to develop a large part of the control software on the actual system, usually under poor conditions. The results are short test phases for the software and quality defects resulting from this. Hardware-in-the-Loop Simulation (HiLS) has proven to be an important tool in order to be able to implement control of the machine early in the development process.

HiLS not only examines the entire system performance but also the control engineering. This is achieved by linking the real control to a simulation which displays the machine behavior in such a way that the control cannot distinguish between the real and the virtual machine. As the control expects actual values from the sensors in a fixed cycle (usually <10ms) and has to provide new set points, it is necessary that the machine operates in real-time. The control and the virtual machine are linked via the SERCOS real-time bus system. The virtual machine displays all of the bus devices contained in the machine via the bus interface so that, for the controller, there is no difference between the virtual and the real machine.

The benefits of HiLS are:

• Use of real control technology on the real plant is possible, whereby all control functions can be fully considered.
• Fully synchronous processes are thus very realistic from the point of view of both the controller and the user.
• No virtual image of the controller is necessary and thus there are no problems of availability from the controller manufacturer.

Besides the virtual implementation, there are other fields of application which are especially beneficial for the machine manufacturer. These are found in the machine development, the

operation of the machine, in training and in the presentation. HiLS has particularly established itself as an aid in all disciplines in the field of machine development. The construction of a virtual machine opens up a common basis for discussion for all disciplines at an early stage. The increased exchange of information among the disciplines allows knowledge about the machines to build up, which means problems can be recognized early and the maturity level of the development is increased at an early stage. In particular the software development sector benefits from the pre-implementation of the machine which it can carry out safely. The early implementation gives the programmer more time for the actual implementation, i.e., to test and validate the program available, in other words the "time-to-market" of the newly developed product is reduced. In addition to the development departments, the customer of the machine manufacturer also profits from HiLS. He/she can test various controllers using the virtual machine during the development process. In this way, the manufacturer of the controller is required to provide the functional proof of the controller from the outset. While the plant is being operated, optimizations can take place using the HiLS, without having to deal with shut-down time. In order to do this, various scenarios for increasing the cycle time are used. The same applies for changing over the plant. While production is underway, control programs for the next

product to be made can be prepared with the help of the simulation. This shortens the lag phase. In addition, the possibility of using HiLS to support the machine diagnosis is currently being investigated. By comparing the current or torque flows of the motors in real and simulated machines, conclusions can be drawn regarding possible errors and wear of the machine, which can, in turn, be used for a maintenance plan.

Another field of use of HiLS is the training of machine users. With the help of HiLS, it is no longer necessary to use real plants in training; training can be carried out on the real controller with the machine model in separate training rooms. This avoids costs for expensive training equipment or shut-down times of the actual plant.

Core topics of current research activities are the detailing and display of dynamic behavior in real-time models. This includes finite elements, (FE) models and models of the machining process. Reduction procedures and calculus are being investigated for FE models which provide for efficient real-time calculation with excellent accuracy. Besides the development of new simulation methods for real-time calculation, the description of re-usable models for virtual knowledge-based product development is another research topic. Here, simulation methods are generically displayed so that they can be generated for various simulation tools and do not have to be re-generated each time. Thus, the time required for creating the model can be significantly reduced.

Real-time machine models are not only used for HiLS; they are being increasingly integrated into the controller using the increased efficiency of the PC-based controllers, whereby it is possible to simulate the behavior of the machine (e.g., the dynamic behaviour) right from the path
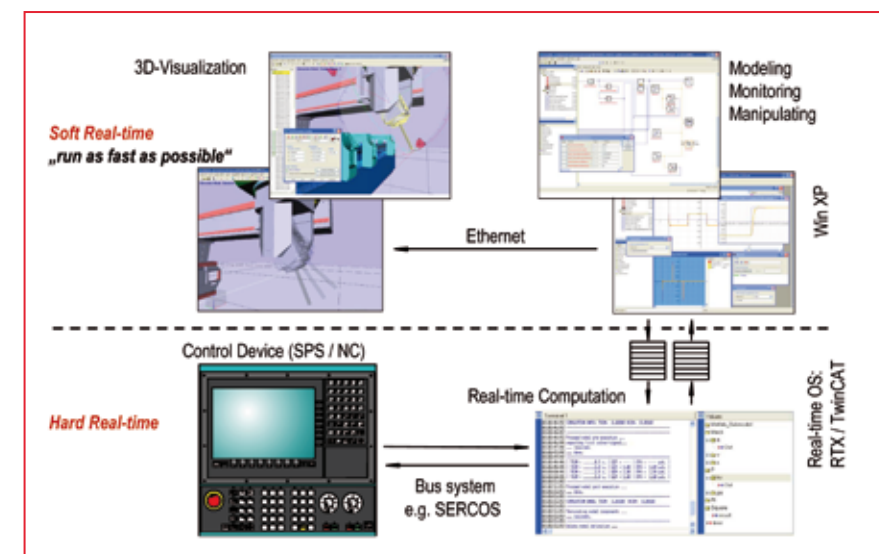
Set-up of a Hardware-in-the-loop Simulator

planning stage and for this to be taken into account in the set point generation. The field of HiLS already offers a multitude of opportunities for reducing the development time and improving the process results. At the same time, it offers enormous potential for increasing the informational value of the simulation results even more. The Hardware-in-the-Loop

Simulator "virtuos" has resulted from the intensive research activities of the Institute for Control Engineering for Machine Tools and Manufacturing Units (ISW) in cooperation with the "Industrielle Steuerungstechnik GmbH" (ISG). Today extensive model libraries are available which allow simple machine functions (logic, kinematics, material flow) as well as complex,

physical phenomenon (mass dynamics, vibration behavior, collision and contact problems, friction etc.) to be displayed in real-time. In these models and the connection over real-time bus systems to the controller, research results and practical experience of many fields are combined to guarantee a virtual behaviour very close to reality. Some "virtuous" model examples are illustrated in the title illustration.

Contacts:
Stuttgart University
Institute of Control Engineering for
Machine Tools and Manufacturing Units (ISW).
Seidenstr. 36, 70174 Stuttgart
www.isw.uni-stuttgart.de

University of Stuttgart
Exzellenzcluster SimTech
Pfaffenwaldring 7a, 70569 Stuttgart
www.simtech.uni-stuttgart.de

Quick-Info 1–1005 ▲

Motion and I/O:
Together with SERCOS III

SERCOS III Coupler for the WAGO-I/O-SYSTEM

• Full support for SERCOS III V 1.1.1 protocol
  • Compatible with the SERCOS III I/O profile
    • Device description via SERCOS Device Description Meta Language (SDDML)
      • Additional I/O fieldbus no longer required
        • I/O nodes synchronous with SERCOS cycle
          • Redundancy possible through ring topology
            • 100 Mbit/s
              • Additional standard Ethernet TCP/IP channel with TCP/IP, HTTP, FTP, BootP, DHCP, SNTP, Web Based Management

www.wago.com

WAGO ®
INNOVATIVE CONNECTIONS

Presentation of certificates at SPS/IPC/DRIVES in Nuremberg – from left to right: Dr. Roland Steffan (Bosch Rexroth), Dr. Oliver Wetter (Wago), Volker Lutz (Phoenix Contact), Thorsten Matthies (Phoenix Contact), Leif Malmberg (HMS Industrial Networks), Hans-Jürgen Hilscher (Hilscher Ges. für System-automation mbH).

First SERCOS III Conformance Test Certificates issued

At the SPS/IPC/DRIVES show in Nuremberg, Germany, SERCOS International issued the first certificates for conformance-tested SERCOS III products. The testing was executed by the SERCOS testing laboratory at the University of Stuttgart using the new testing tool, the SERCOS III Slave Conformizer.

This consists of extensive test procedures which check the conformance of a device with reference to the SERCOS III specification. In this process not only the correct behaviour of the device in the usual case is tested,

but also the error reaction of a slave in case of a simulated wrongdoing of the master. The tests cover the communication protocol, the generic device profile (GDP), and the function-specific profiles for drives and I/Os (FSP I/O and FSP Drive).

The first conformance certificates were issued for products of the following manufacturers:

• Hilscher Ges. für Systemautomation mbH for a SERCOS III slave communication module
• HMS Industrial Networks for a SERCOS III slave communication module (Anybus-CC)
• Phoenix Contact GmbH & Co. KG for the digital and analogue Block I/O, as well as a bus coupler for modular I/Os
• Wago Kontakttechnik GmbH & Co. KG for a bus coupler for modular I/O
• Bosch Rexroth AG for IndraDrive servo drives

The certified devices may be labelled with the „SERCOS Conformance Tested" logo, attesting to the high quality of implementation.

SERCOS III Slave Conformizer tool

The SERCOS III Slave Conformizer is provided as a complete test and development environment for SERCOS slave devices. It includes an active PCI-SERCOS III card and the test software, which runs under Windows XP without the need for real-time extensions. The Conformizer is an easy-to-use package with a GUI based on the Eclipse framework. Tests activated by the GUI are specified using the Ruby script language. Pre-defined scripts can be easily modified or user scripts can be written. The tool includes a command shell as well as different browsers.

Contact:
SERCOS International e.V.
Küblerstraße 1, D-73079 Süßen
Phone: +49 (0) 7162/9468-65
Fax: +49 (0) 7162/9468-66
www.sercos.de
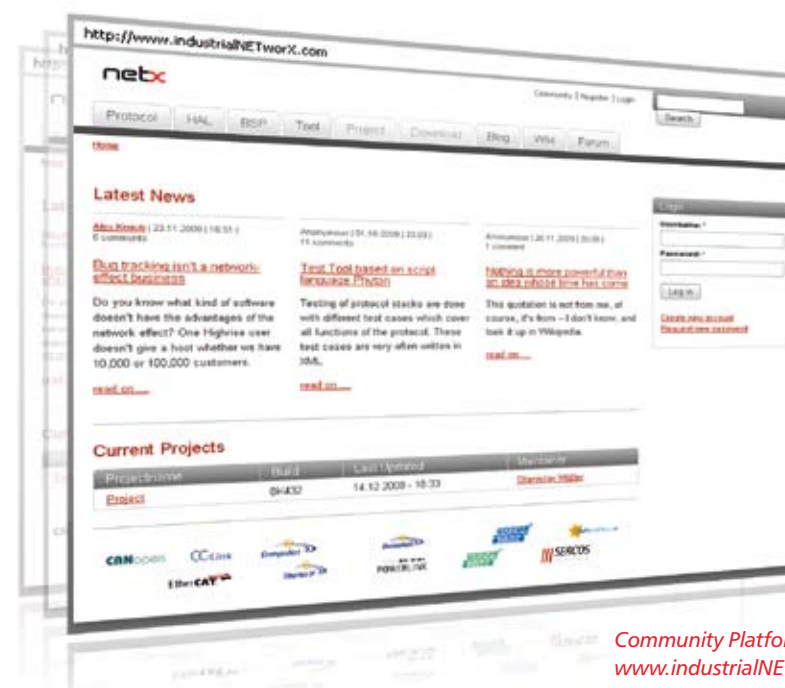
Community Platform for „netX" technology: www.industrialNETworX.com

SERCOS III Slave Stack for netX available in source code free of charge

Hilscher Ges. für Systemautomation mbH in Hattersheim breaks new ground: A "netX" community platform has been established and protocol stacks for "netX"-based slave devices are made available free of cost. This initiative was announced at SPS/IPC/DRIVES 2009 and aims at increasing the application area and market shares of the "netX" technology.

The key role is taken by the slave protocol stacks that will be made available in source code for free. Thus, these stacks can be ported to other operating systems and hardware platforms much easier and much faster. The license conditions entitle the users to modify the stack software, to combine it with their own software, to copy, to distribute and to execute the stack software on or in combination with the netX controllers. At the same time the users are obliged to publish the source code only combined with the documentation and the terms of the license. In addition, the stack software that was ported on other operating systems has to be made available in source code.
In this context, the "netX" community platform serves as an independent information and discussion platform for product managers, users and developers of automation devices.
Hans-Jürgen Hilscher: „Directly after Hannover Fair 2010 the SERCOS III slave protocol stack, which is already used in a large number of SERCOS III devices of renowned manufacturers, will be made available as source code free of charge – as one of the very first stacks in the world."

Contact:
Hilscher Gesellschaft für Systemautomation mbH
Rheinstr. 15
D-65795 Hattersheim
Phone: +49 (0) 61 90/99 07-0
Fax: +49 (0) 61 90/99 07-50
www.hilscher.com

Quick-Info 1–1007 ▲

Quick-Info 1-1008 ▼

Modular control system with SERCOS III interface

With the SCS 3 control and IO system AUTOMATA introduces a compact and modular device family with SERCOS III interface. Its technical features make the SCS 3 system ideally suited for the automation of modular machines. SCS 3 devices are programmable with IEC-61131 or "C" language. They combine the advantages of a cost-efficient compact control with fast, highly synchronous and safe communication over SERCOS III. The device family comprises several variants: a base unit with two MODULbus sockets for I/O modules (digital, analog, encoder, positioning modules) or additional communication interfaces (SERCOS II, PROFIBUS, CAN, RS232/485), a base unit with fast digital I/O's and a compact operator panel with QVGA display and keyboard. All devices are available with SERCOS III master or slave interface and are equipped with a MicroSD slot to store data and programs, a real-time clock and NVRAM.

SCS 3 – a compact and modular control and IO system with SERCOS III master or slave interface

www.automata.de

Quick-Info 1-1009 ▼

RZA-Ethernet Monitor: A powerful tool for analysis

The RZA-ETM Ethernet Monitor from Distributed Systems Engineering GmbH (DSE) represents a flexible modular platform for customized measurement and testing solutions. The basic features of the Ethernet Monitor are timing analysis and tracing of Industrial Ethernet systems. Based on flexible user-defined trigger conditions, inputs can be captured synchronously to the Ethernet messages. Each received Ethernet packet is tagged with a precise timestamp and can be forwarded to a PC for detailed analysis of both the packet-content and the timing.
DSE provides expertise and skills to support SERCOS III development and integration. In cooperation with SERCOS International and ISW (University of Stuttgart), DSE is in charge of SERCOS III conformance testing. In addition, DSE offers training and consulting during the entire development process.

The RZA-Ethernet Monitor from DSE: For precise timing analysis and tracing of Industrial Ethernet protocols

www.distributed-systems.de

DSE
Distributed
Systems Engineering

Quick-Info 1-1010 ▼

Cabling components for SERCOS III

HARTING has developed a portfolio of cables and components for SERCOS III applications. The user is able to select from a number of mating interfaces, choosing the best fit for the specific requirements. Connecting hardware for IP20 environments, as well as for IP65/67 harsh environments, is available. In addition, pre-assembled system cables are offered that are tailored to the exact length for the application. For example, SERCOS III devices can be networked in a line topology, with the devices installed in sequence, side by side. Depending on the control system, the number of SERCOS III devices can reach several hundred units on one line. A SERCOS III control unit is linked to the slave devices via a system cable. The installed SERCOS III network can be closed to a ring configuration with an additional secondary system cable from the last unit in the line to the control. Following this procedure, operational safety is guaranteed in the case of an interrupt of the cabling. HARTING supplies the SERCOS III cables that are used at each mode, even in the most complex demanding systems.

SERCOS III Cabling by HARTING

www.HARTING.com

|||SERCOS interface

Quick-Info 1-1011 ▼

Servo position controllers with SERCOS II and SERCOS III interface

Metronix has developed and produced innovative control technology with a focus on intelligent servo position controllers for more than 30 years. In the last 5 years, Metronix has further expanded its competence in the SERCOS area. Controllers provided with optional SERCOS II interface can be integrated in the fieldbus structure as slaves. Thus, a fail-safe, powerful and manufacturer-independent bus technology is available to the machine manufacturer, efficiently supporting highly dynamic automation processes. That's why servo position controllers with the SERCOS interface are particularly suitable for application in demanding growth markets like solar technology, LCD panel production, wafer handling and production systems for new battery technologies for alternative vehicle drives.

Currently, a real-time Ethernet module that will support SERCOS III and more real-time Ethernet-based standards is being developed. In order to satisfy the continuously growing requirements for shorter cycle times and to support highly dynamic applications in the future, Metronix launches the new ARS 2000 device series. In addition to a considerable performance increase, the new ARS 2000 servo position controller meets the high requirements of the safety technology according to EN 61800-5-2 in modular design. In this connection, support of current communication interfaces like Ethernet/IP and USB is a matter of course.

With the support of Ethernet-based and real-time compatible communication systems, Metronix opens up new, simple ways for machine manufacturers and system integrators to enter new markets in a short time

www.metronix.de

COOPER Tools

|||metronix servo drives

Now more PacDrive than ever!

With PacDrive 3, we've created a future-proof automation technology for your success:

Fully Ethernet-based communication, even higher performance, an integrated safety concept, and a modular drive design for single and multiple-axis applications help you future-proof your machine automation and achieve greater cost efficiency.

A workbench with all the tools you need for engineering, commissioning, and service, as well as a multi-user concept, gives you the scope to proactively design advanced interdisciplinary project processes.

What hasn't changed: PacDrive 3 remains true to our proven methods, which support faster implementation of your projects.

PacDrive 3 now available!

ELAU

Schneider Electric

Quick-Info 1-1012 ▼

PacDrive 3: Ethernet-based communication

With PacDrive 3, ELAU, a Schneider Electric subsidiary, introduces the follow-up tech-nology for the PacDrive M automation solution that has been successful for more than 10 years. In PacDrive 3, tried and tested methods for reducing engineering, commis-sioning and service times have been ported to forward-looking technology. Existing PacDrive M projects can be easily transferred. As an Ethernet-based, continuous automa-tion bus, SERCOS III forms the basis for integrated safety solutions and ensures that the bus is no bottleneck. Even higher performance with fine scalability mark the range of the new controllers and a modular drive concept for single and multi-axis applications reduces the costs for servo drive solutions. A workbench with all tools for engineering, commissioning and service as well as a multi-user concept, offers space for the design of interdisciplinary project processes.

SERCOS III is the basis for the continuous high-performance PacDrive 3 automation bus with integrated safety solution

www.elau.de/pacdrive3

Schneider Electric

Quick-Info 1-1013 ▼

Weidmüller IE-Line Connectors for SERCOS III

With the appearance of the new wiring guideline for SERCOS III networks, the end user now has clear and defined standards for installation. The defined cable and con-nectors in this guideline build the basis for secure wiring of SERCOS III applications. Weidmüller has implemented the requirements of this guideline in their IE-Line con-nectors with *STEADYTEC*®-technology. Starting with 19 inch patchpanels and Din rail outlets inside the switch-cabinet, right through to sturdy IP67 connectors in the field, Weidmüller offers all infrastructure components for SERCOS III networks. The M12 and RJ45 connectors are characterised by exceptional robustness and the ca-pability of field harnessing without special tools. Fibre optic connectors and cables also compliment the range. Weidmüller components are able to satisfy the require-ments of even the most demanding SERCOS III application.

*IE-Line Connectors with **STEADYTEC**® Technology for SERCOS III conforming to the Planning and Installation Guideline.*

www.weidmueller.de

Weidmüller

ARS 2000 News

➢ Short cycle times down to 31 µs
➢ 4-times over-current
➢ High Performance
➢ Support for SERCOS II
➢ Current development of Ethernet based fieldbus systems such as SERCOS III
➢ Recent development of modular safety systems according to EN 61800-5-2

metronix
servo drives

Openconcepts

Universal servo positioning controller ARS 2000

Metronix Messgeräte und Elektronik GmbH
Kocherstraße 3 · 38120 Braunschweig · Germany
Phone: +49 (0)531/8668-0 • www.metronix .de

COOPER Tools

++++ *NEWS* +++++ *NEWS* ++++   Quick-Info 1-1014 ▼

CeBIT 2010 – Show time for Open Source

www.osadl.org I www.sercos.de

The "Open Source Automation Development Lab" (OSADL) was represented as one of 15 Open Source initiatives at the CeBIT 2010 in Hanover (3.-7.3.2010). Since Real-time Linux has estab-lished itself as standard operation system for embedded systems and industrial automa-tion, now the integration of Real-time Ether-net protocol stacks in the Mainline-Linux Kernel is driven forward. The realisation of SERCOS III Master Stacks is based on the Co-SeMa (Common SERCOS Master) library which was released as Open Source software under the LGPLv2 license in November 2009.
The software is available for download at https://sourceforge.net/projects/cosema.

CeBIT

open source meets industry

|||SERCOS interface

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SERCOS III Seminars available as Webcasts

www.sercos.com

A seminar with a total of nine lectures "about SERCOS III" is available as webcasts on the homepage of SERCOS North America. The lec-tures were recorded in the context of a one day seminar which was held in Atlanta (USA) in September 2009. The presentations include not only a very good introduction into the subjects of real-time, Ethernet and SERCOS, but also deal with interesting and innovative products, components and applications relat-ed to SERCOS III. The presentation material is also available as downloads.

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SERCOS intensifies activities in Asia

www.cameta.org.cn I www.sercos.org.cn

In Asia, the demand for integrated automation solutions and a greater flexibility in produc-tion is continuously increasing. For this reason, SERCOS International is intensifying its activities in the Asian region. Exhibition presence is plan-ned for several trade shows in China and India. Furthermore, SERCOS III related seminars and workshops are scheduled for China, India and Japan. Moreover the cooperation with CAMETA (China Association for Mechatronics Techno-logy & Application), a non-profit organization engaged in the development and fabrication of mechatronic technologies and products, is in-tensified.

EtherNet/IP **PROFINET** **|||SERCOS** interface
ETHERNET POWERLINK **Modbus/TCP** **EtherCAT.**

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June 30 - July 01, 2010, Zurich/Suisse

Automation 2010
Sept. 21-24, 2010, Mumbai/India

PackExpo
Oct. 31 - Nov. 03, 2010, Chicago/USA

Industrial Automation Show
Nov. 09-13, 2010, Shanghai/China

SPS/IPC/DRIVES
Nov. 23-25, 2010, Nuremberg

Industrial Automation India
Dec. 15-19, 2010, Mumbai/India

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