

GLEICHMANN Newsletter

Empowered by Innovation



Full service initiative in industrial communications

For many years, the name Gleichmann is synonymous with extraordinary, far-reaching design-in support. Whether in the field of Motor Control, Health Care, Building Management or Industrial Automation, only one thing

and has gifted us with a unique design competence. In some particularly expansive segments even our specialists are, now and then, dependent on external support. One example of this is in the field of industrial communications.

PROFIBUS, DeviceNet, Modbus, Ethernet, CC-Link, ControlNet, CANopen, Interbus, Foundation Fieldbus, Lonworks, AS-Interface and Bluetooth. How do I bring all of the topologies used in our company under

one roof? Are there technologies and products, which are equally suitable for all applications and which once again help me to be able to calculate the effort and costs? These are simple questions, but simple answers are not so easy. Those of you that already have practical experience with industrial communications networks know the underesti-

mated complexity of this thematic and the numerous pitfalls lying in wait.

(Continued on page 2)



counts for us: "the optimum solution for each customer". This is embedded in the minds of all our employees

Just the sight alone at some of the following terms is enough to make some users break out in a sweat:

MINICUBE2 – another revolution!

In recent years, NEC Electronics' CUBE tools have revolutionised the development of microcontrollerbased applications, offering a combination of market-leading features, innovative functions for developing in situ and above all low-cost. This range is now further enhanced by the introduction of MINICUBE2, a new fully-featured on-chip debugging and Flash programming development tool

with a whole lot more to offer.

MINICUBE2 has 6 key features

1. On-chip debugging and full Flash programming functionality
2. Single-tool support for 8-, 16- & 32-bit microcontrollers
3. Easily upgradeable for any future Flash microcontrollers
4. Powered by USB so no external supply necessary

Special offer! € 50,-

instead of € 100,- for orders until 8th of December

5. Just 4.8 cm²!

6. Low price!

Let's now take a look at these in more detail ... The on-chip debug (OCD) peripheral is a common function of NEC Electronics' latest Flash microcontrollers, and using this function, MINICUBE2 enables debugging of a device on the target system itself.

(Continued on page 2)

Spotlights

LEDs from Harvatek

New to Gleichmann's product portfolio are the SMD LEDs and POWER LEDs from Harvatek. Founded in March, 1995, Harvatek is one of the world's top five SMD manufacturers with an installed capacity of 300 million units per month at its factory in Taiwan. Gleichmann is one of Harvatek's major distributors, particularly in Germany, but also throughout Europe via its subsidiaries.

Gleichmann joins PNO Member list

As of November 1, 2006 Gleichmann is a member of PROFIBUS Nutzerorganisation e.V. (PNO). A permanent PROFIBUS & PROFINET International (PI) Support Center (PISC), based in Karlsruhe, Germany, manages global activities assisted by the German PNO. PI's goals are the worldwide advancement of the PROFIBUS and PROFINET technology, know-how transfer and protection of investment.

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Full service initiative in industrial communications (Continued of page 1)

In the run-up to this year's SPS/IPC/DRIVES 2006 in Nuremberg, Gleichmann has set itself a goal: to end this dilemma by means of a unique initiative. In addition to NEC Electronics und Wind River, we have also been able to win over additional well-known names - like Gleichmann, also members of PROFIBUS Nutzerorganisation e.V. (PNO) - for a PROFINET partnership. This will, in future, allow Gleichmann to be the first components distributor to offer all services and products relating to PROFINET from a single source. One example is the close partnership with the Technologie Management Gruppe (TMG) in Karlsruhe, Germany. For more than 20 years, TMG questions conventional thinking patterns and

therefore, opens up new chances for sound competitive differentiation, while at the same time being fast, consequent and results oriented in execution. In future, Gleichmann customers will, if required, not only have access to our own internal experts, but also the experienced TMG designers and consultants will be placed at their disposal for all questions relating to PROFINET. Together, we will support you with: knowledge transfer and building, technology selection, development of customer specific hard and software solutions as well as the preparation for the necessary certification. Detailed information about TMG can be found on page 6/7 of this Gleichmann Newsletter. Our full service concept in the field

of industrial communications is ideally supplemented by the addition of the innovative products from HMS Industrial Networks to our line card. HMS designs and manufactures intelligent communication technology for automation equipment and provides reliable solutions to connect devices to any major network protocol and products enabling interconnection between different industrial networks. The Anybus range of products from HMS is today the world's most used 3rd party product for industrial network connectivity. Interchangeable Anybus interface modules, Gateways, & PC interface products provide a complete and reliable way to connect your product to a wide range of standard busses. For more information, regarding

the philosophy and products of HMS, see page 3 of this Gleichmann Newsletter. Whether in the field of Motor Control, Health Care, Building Management or Industrial Automation, you can profit from Gleichmann's, for a components distributor, unique competence as a solution provider. Experience the possibilities offered to you by PROFINET and NEC Electronics' ERTEC.

Visit us and our partners in
Hall 6/Booth 210



+49 7249 910-437
NECMicro@msc-ge.com

Response number 111

MINICUBE2 – another revolution! (Continued of page 1)



The revolutionary MINICUBE2

Since debugging takes place with the target device operating on the board, it also makes MINICUBE2 ideal for debugging in the field. Depending on the target device, MINI-CUBE2 offers an abundance of debug features, including 2 hardware break points for real-time debugging, 4 ROM area software break points and 2000 RAM area break points. Run, Run from Here, Run to Here, Restart and step execution are also included, plus forced break, RAM monitoring, time measurement, Reset pin masking and writing to memory during RUN (DMM). For extra security, a 10-byte ID

code authentication is also provided. Debugging takes place through one serial function (3 or 4 pins) with user memory space or through the OCD interface, again depending on the target device. The same unit offers full Flash programming functionality, suited to both the development environment as well as mass production. Using a standard programming interface and parameter file, 3.0 V or 5.0 V power can be applied with either a 4 MHz, 8 MHz or 16 MHz clock. Security setting is also available. In addition, MINICUBE2 also features a self-testing function to detect faults and perform maintenance. A single MINICUBE2 unit will support most NEC Electronics Flash microcontrollers, including the low pin count 78K0S 8-bit range, the 78K0/Kx2 general purpose and 78K0/Lx2 LCD controller 8-bit ranges, the V850 All Flash

general purpose 32-bit ranges and the brand new 78K0R/Kx3 16-bit range. And in case you get confused, a clever multi-coloured LED will tell you exactly which technology the unit is currently set for! As well as supporting existing devices, MINICUBE2 has also been future-proofed with the capability to update the firmware using a simple Web download, so you can be sure that as NEC Electronics continuously releases new Flash microcontrollers in the coming months and years, you can keep using the same tool. With a USB cable included, there is no need to use any other external power source – simply plug in and either start the debugger to use the on-chip debug function or start the programming GUI to perform Flash programming. To make getting up and running even easier, an appetiser version of the very

latest IAR Workbench for use with MINICUBE2 is now available to download from the web, with individual device target boards also available to enable instant evaluation of NEC Electronics' Flash microcontrollers using the on-board clock, LEDs, switches and a universal prototype area. All of this functionality is provided in an ultra-compact, ultralightweight tool. MINICUBE2 is just 4.8 cm² and only 30 g, so you can easily carry it in your pocket if you really want to! And at around one-third of the cost of the original MINICUBE, which is already well known for being a very low cost tool, it is now almost impossible to find a reason not to start developing your next project with MINICUBE2 right now!

+49 7249 910-437
NECMicro@msc-ge.com

Response number 112

HMS – our new partner for automation networking and connectivity

Gleichmann is proud to introduce a new strong partner for the Industrial Automation Initiative. HMS Industrial Networks is the leading independent supplier of embedded network technology for automation devices. HMS develops and manufactures solutions for interfacing automation

devices to industrial networks. Development and manufacturing takes place at the head office in Halmstad, Sweden. Local sales and Design-In support for device is provided by the branch offices in Chicago, Beijing, Karlsruhe, Milan, Paris and Tokyo. HMS employs 128 persons of which 35 in R&D

and reported sales of €20 million in 2005. HMS produces more than 120.000 Anybus modules per year and has an installed base of 460.000 modules in Q3/2006. Gleichmann Electronics and HMS have signed a cooperation agreement in September 2006. Gleichmann Electronics



will distribute Anybus-CC modules in Germany, Austria and Switzerland from November 2006 on.

HMS – Plug-In Communication Modules for all Industrial Networks

Anybus-CC provides a flexible communication interface for automation devices



Anybus-CompactCom (Anybus-CC) modules are designed to meet the increasing communication requirements in industrial automation. Automation devices with an Anybus-CC slot on board can be instantly connected to all major fieldbus and industrial Ethernet networks.

More Flexibility

The Anybus-CC modules are designed similar to a Compact Flash card, featuring small size, low price and easy integration. These smart cards provide the performance and

functionality level required to meet the communication demands of intelligent automation devices such as HMI's, robots, inverters, instruments and scales.

Saving up to 70% Development Cost

The modules are fully standardized regarding their mechanics and hardware/software interfaces. Automation devices with an Anybus-CC slot on board can use all available modules and achieve instant connectivity to all major industrial communication standards. Anybus-CC considerably simplifies the development work required to implement a multi network communication interface and is - even in high volumes - an

attractive alternative to in-house developed network interfaces.

For all Fieldbuses and Industrial Ethernet

Anybus-CC modules are intelligent

communication option cards. The complete protocol of the specific network is performed by the Anybus-CC module. This offloads the microprocessor of the automation device from all time critical protocol transactions. Active Anybus-CC modules are based on the Anybus NP30 RISC microprocessor. NP30 is a powerful multi-network controller which was developed by HMS to perform the hardware and software tasks of an industrial network protocol on a single chip. As of October 2006, the Anybus-CC series consists of solutions for Profibus-DP, CANopen, DeviceNet, Modbus-RTU, Modbus-TCP, EtherNet/IP, USB, RS-232 and RS-422/-485. Further modules for Profinet IO, ControlNet, Interbus, Lonworks, CC-Link and Bluetooth are under development and will be released shortly.

Easy Handling

The small but rugged housing is designed for use in industrial environments. The mechanics include an easy slide-in and reliable locking mechanism. No specific tools are necessary to install the Anybus-CC

modules and thus they can be installed anywhere in the delivery chain from the device manufacturer to the end customer. This simplifies logistics, reduces the stock level and allows easy selection of the desired network interface. The use of the standard CompactFlash connector reduces price and ensures availability from multiple sources.

Uniform Software Interface

The Software interface (API) between the Anybus-CC module and the automation device has been fully standardised by HMS. The object oriented interface method permits a maximum of network independence and interchangeability. The Anybus-CC host application interface supports both asynchronous fast serial as well as a Dual Port Ram based parallel interfacing. High data throughput and low power consumption based on 3,3 Volt technology let the Anybus-CC modules fit well into all kind of modern automation devices.



+49 711 78336-149
rsen@msc-ge.com
Response number 113

Ethernet + Profinet + IRT = NEC ERTEC!

NEC Electronics, in January 2006, launched a new and unique series of Enhanced Real Time Ethernet Controllers (ERTEC) designed to deliver class leading real time performance for Industrial Automation equipment

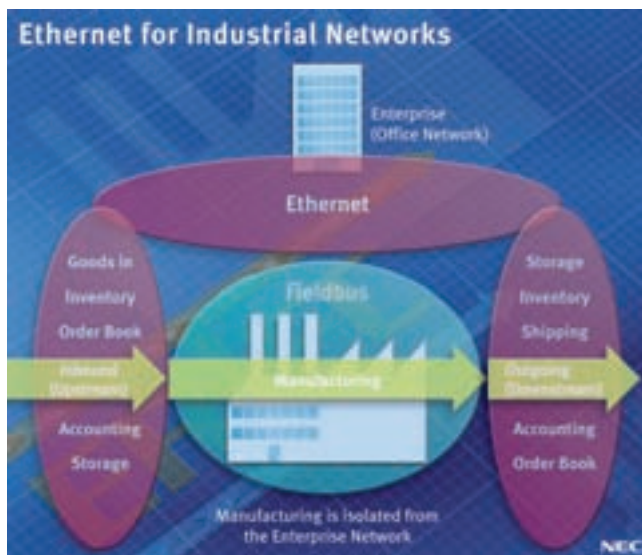
Ethernet network closely coupled to inventory management, order management, and accounting systems. The manufacturing floor, however, is most likely managed by one or more fieldbuses such as Profibus. In addition to a

based on Ethernet however they directly impact manufacturing efficiency. If incoming goods and outgoing goods are managed using Ethernet it only makes logical sense to manage the industrial manufacturing network in the same way. In fact manufacturing is the only part of the business that is not based on Ethernet today. It is therefore not easily accessible from the enterprise network. In fact easy access is only possible directly from the factory floor. Accessibility is only part of the argument for Ethernet on the factory floor. Total cost of ownership can also be greatly reduced through the use of Ethernet. In today's fieldbus based systems, installation, wiring, and maintenance costs are high because specialised knowledge is required to set up new machinery. This is very unlike the Ethernet world, in which a new piece of equipment is simply plugged into the 'Ether' and is instantly connected to the others. Set up and programming becomes easier as communication between a PC and any Ethernet connected device is well known. As a result assembly lines can be tuned very easily to alter speed or function, or

to perform routine maintenance at very low cost and with minimal disruption to the assembly line itself.

Performance and flexibility

Machines within assembly lines require precise synchronisation to ensure maximum throughput. Any delay at any point on the line causes a delay in the entire process, which could lead to severe cost penalties. Today, factories use fieldbuses such as Profibus, which ensure that communications can deliver the performance required to maintain synchronisation. This is also referred to as real time performance. It is obvious to see the detrimental effects of introducing TCP/IP data from the office network into the real time environment of the factory. Although there are significant advantages to converting the factory to Ethernet, among them the advantage of connectivity with the enterprise network, it is clear that real time performance, hence speed of communications, must be taken into account. The two main factors that affect speed of communication are processing time and transmission time. Process-

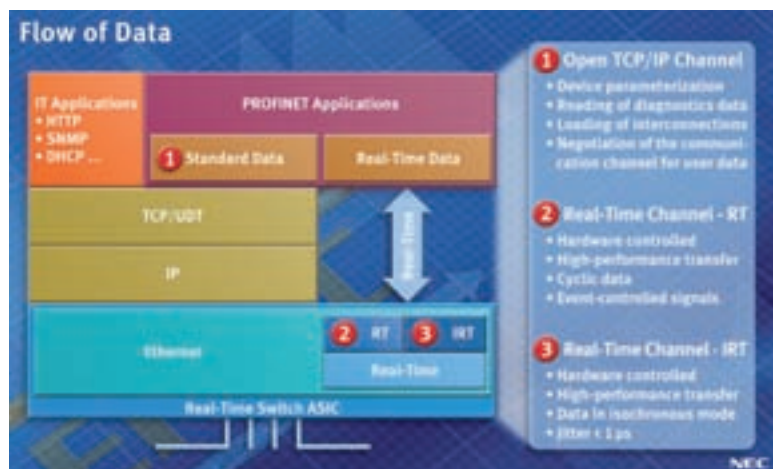


based on Profinet. The growing demand for reduced cost of ownership, increased flexibility, and greater control of the factory floor has been driving increasing sales of Industrial Ethernet devices. The ARC advisory group expects 51.4% CAGR growth in Industrial Ethernet device sales through 2009. With the launch of these new ERTEC devices NEC Electronics has positioned itself as a leading player in the supply of real time Ethernet solutions.

Why Ethernet for industrial networks?

The organic growth of communications within the factory has led to a complex network of different standards for the many different areas within factory and process automation. Upstream (goods incoming) may be managed by an

major fieldbus, industrial networks also may include multiple local buses based on simple serial protocols like CC-Link or (Actuator-Sensor Interface) ASi. As such neither communication is compatible with the others or with Ethernet. Ethernet is the accepted standard for enterprise networks and carries communications to all parts of an organisation responsible for running day to day business. Systems based on well renowned databases like SAP and Oracle regularly aid in management of inventory, order book, and customer relationship. All of these aspects are held in the enterprise world and are therefore





ing time includes the time it takes to identify and mark data as real time. Transmission time is the time it takes for the data to get from sender to receiver. Processing time is dependent on the processing power available from the CPU, as the data is read and labelled as real time by software. The less work that must be done by software the shorter the processing time and the faster the data can be made ready for transmission. Transmission time is most greatly affected by network traffic. The more data that is present on the network the longer the transmission time.

Profinet – a new wave in industrial networking

Profinet is an open standard that maximises communication speed by minimising both processing and transmission time. Processing time is minimised by the use of a fast ARM9 CPU to process data as quickly as possible. Transmission time is minimised by dividing the standard Ethernet bandwidth into two channels, one for standard non real time TCP/IP traffic and the other dedicated to real time traffic. Real time traffic is inserted into the standard flow of data at predetermined times ensuring that this data is available on the network as

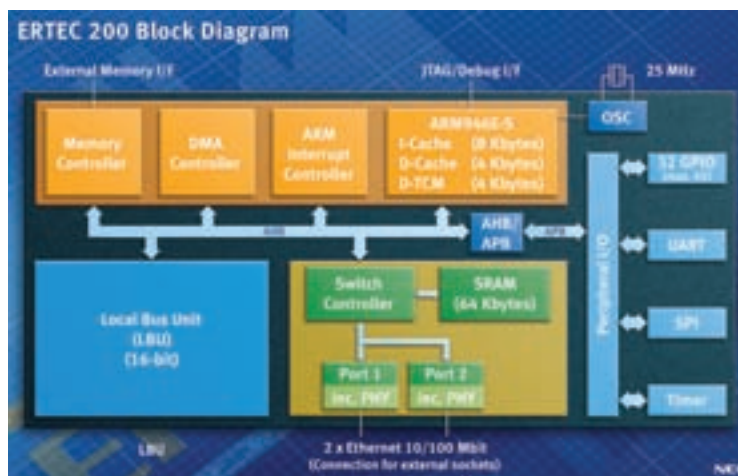
soon as possible. The time between real-time 'slots' is predetermined and constant, so deterministic behaviour is guaranteed. This is called Isochronous Real Time (IRT). The analogy is that of a fast lane on a highway in which only real time traffic is allowed. Not only is real time performance guaranteed but the solution is completely compatible with existing Ethernet networks. Standard TCP/IP traffic can be used in combination with IRT requirements. Profinet allows for three levels of performance – standard non real time, soft real time, and IRT. This allows Profinet to span the entire range of industrial network solutions, from non real time I/O modules to IRT based motion controllers requiring less than 1 ms cycle time and less than 1 μ s jitter. This wide scope of performance is the reason why many communications standards exist today within the industrial network. However, Profinet has the potential to coexist with these standards and also to allow equipment based on these standards to communicate with the rest of the industrial and enterprise network. Cost of installation is extremely low as very little

systems integration is required. Because the Profinet network is self managing for IRT traffic, there are no pre-requisites for the network topology. Maintenance costs are also low because any tuning or diagnostics can be run from a PC using non real time data. There is no need to go to the factory floor and no need to interrupt the line.

ERTEC – enabling deterministic real time performance

The ERTEC device from NEC Electronics delivers the performance required by Profinet by including an intelligent hardware network switch on chip that performs the time slicing required for IRT. It creates the fast lane

range integrates two or four standard Ethernet ports including the physical layers, which eliminates the need for multiple linear discrete components – thereby reducing the bill of materials for Profinet applications. ERTEC is currently available in two variants, ERTEC200 offering two Ethernet ports, and ERTEC400 offering four Ethernet ports. Both are based on the Fast Ethernet (100 Mbps) standard delivering high bandwidth for both real time and non real time data. Development kits are now available for both variants and include ten samples of either the ERTEC200 or ERTEC400. The integration of industrial and enterprise networks is an inevitability that opens up possibilities for reduced cost,



necessary to guarantee real time performance. NEC Electronics is the only semiconductor supplier of a device that conforms to all aspects of the Profinet standard.

Reducing the bill of materials for Profinet applications

As well as delivering real time performance the ERTEC

increased efficiency, and unsurpassed flexibility for manufacturers. Profinet delivers on its promise of enabling that integration and the NEC Electronics ERTEC device range is the only solution capable of enabling the full range of Profinet functionality.

+49 711 78336-149
rsen@msc-ge.com
Response number 114

Bright future for ERTEC and PROFINET in industrial automation



The total number of installed industrial Ethernet nodes is estimated to exceed 13 million by 2010. One of the reasons for such an optimistic prognosis is, among others, new innovative components, such as the ARM9 based Enhanced Real Time Ethernet Controller (ERTEC) from NEC Electronics. Wolfgang Wagener, Technical Product Support at NEC Electronics Europe answers five questions regarding ERTEC and PROFINET:

Where do you see the advantages of PROFINET?

"We see the advantages of PROFINET essentially in three areas: First of all, there is the high real-time performance. The deterministic data transfer capability of PROFINET ensures that complex, technical control functions (motion control) can be completed, while at the same time the equipment is connected to a classical TCP/IP based network. This is important, because it will be a future requirement to integrate manufacturing plants with the IT infrastructure of the company. Only in this way can it be guaranteed that factories, in a world requiring ever increasing production efficiency, can be operated and monitored.

Secondly, PROFINET is able to operate with all fieldbus protocols. Because of this, it will be very simple to "see" all equipment in the Ethernet network. Manufacturing plants can be upgraded step-by-step with PROFINET bridges, which close the gap between established fieldbus and the IT infrastructure. Last, but not least, the PROFINET protocol is defined in an open standard. All manufacturers of automation equipment can be certain that their PROFINET compliant equipment will operate, without difficulties, with PROFINET equipment from other manufacturers."

Why is NEC Electronics committed to PROFINET?

"NEC Electronics' entrance into the PROFINET market is the result of our cooperation with Siemens Automation and Drives Group (A&D), the leading manufacturer in this field worldwide. The activities of both companies complement each other, in this market segment, in an ideal manner. NEC Electronics is well-known as one of the most important suppliers of semiconductor solutions for industrial applications. We believe that we have a leadership position, particularly in ASIC technologies, and are therefore able to offer class leading solutions for even the most complex Industrial Automation applications."

PROFINET with ERTEC: how do you assess the chances in this market?

"Excellent. I am convinced that PROFINET will establish itself as the future de facto industrial communications standard. Nowadays, in modern manufacturing plants, a high level of flexibility is demanded and not just from the automobile industry, which pioneered modularized production methodologies. In the meantime, the demand to be able to upgrade or replace individual equipment and machines on the production line, without stopping production, is increasing. The required modularization can, however, only be obtained by means of "hot swap" capabilities of the equipment. This means that, in contrast to the current centralized solutions, local intelligence for communication between the equipment is needed. This is exactly the philosophy behind PROFINET and ERTEC: the distribution of intelligence and control of networked equipment in a manufacturing plant. PROFINET provides this flexibility in a unique way from the programmable logic controller (PLC) to the sensor and actuator."

What are the advantages of PROFINET equipment with ERTEC components?

"ERTEC enables customers the simplest and most effective route to PROFINET solutions. This covers the

complete spectrum of PROFINET real-time capabilities from Non Real-Time (NRT) to Isochronous Real-Time (IRT). Beyond this, ERTEC is not just a piece of silicon: a real-time operating system (VxWorks) and the most complex portion of the PROFINET software are already implemented and can be used immediately. This means that, as a rule, the user only needs to carry out simple adaptation for his specific hardware and can, therefore, concentrate extensively on the application software."

How does NEC Electronics support customers with the use of ERTEC components?

"The technical support from NEC Electronics is recognized by customers worldwide as first class. It goes without saying that we also support ERTEC components, in close cooperation with Gleichmann's product specialists, with the same high level as for all other standard MCUs and MPUs. This includes, among others: complete documentation, applications support, technical workshops, Internet based Q&A service and a FAQ webpage. Beyond this, NEC Electronics supports complete solutions for industrial automation with 8/16/32-bit MCUs, a broad range of power MOSFETs, standard and high-speed optocouplers, design support, applications guides, software IP and first leading development tools."

TMG – Competence & services for industrial automation solutions

Gleichmann Electronics GmbH is very pleased to introduce TMG as a partner of the Industrial Automation

Initiative. How can you guarantee that your company will continue to benefit from the possibilities offered by

industrial information and communications technologies? Technologie Management Gruppe (TMG) in Karlsruhe

heTMG Technologie und Engineering GmbH constitutes a pool of experts for information and communi-

cation technologies (PROFINET, PROFIBUS and other industrial Ethernet or fieldbus solutions). TMG's team of highly qualified developers and experienced consultants has been supporting system manufacturers and device manufacturers in production automation and process automation for about 20 years in the field of

- problem oriented technology selection
- system concepts and product specification
- product development
- certification achievement
- building and transferring knowledge

TMG offers trainings and workshops, normally at the customers' site. Furthermore, TMG is an accredited PROFIBUS and PROFINET Competence Centre. TMG's developers are recognized as experts in Embedded Software Engineering and help you integrate communication technologies into your devices. TMG helps you to find the right solution for your device: implemented as a customer design or design of an Anybus module from HMS. As a matter of course,



TMG also gives you support in the integration of your field devices with EDD, FDT or TCI technology into engineering and control systems as well as in the development of tools. TMG is a system partner for Siemens and is cooperating at the integration of device descriptions EDD into SIMATIC PDM. TMG has a close cooperation with Siemens in the integration of IRT functionality into the PCI Card CP1616 of Siemens, the first product with PROFINET IRT and ERTEC 400. Customer

projects with ERTEC 200 and ERTEC 400, based on the development kits of Siemens, are in progress. TMG is the first service provider authorized to use the complete PROFINET Device Sources from Siemens (ERTEC 200) in customer projects. TMG provides implementation of further industrial Ethernet protocols, like Ethernet/IP, as well as special embedded real time operating systems, if required by the customer.

+49 711 78336-149
rsen@msc-ge.com
Response number 115

Powerful nanophosphate lithium-ion cell

Gleichmann offers an extremely powerful, and at the same time environmentally friendly, nanophosphate lithium-ion rechargeable battery from the U.S. manufacturer A123Systems. The ANR26650M1 has a 10x life cycle vs. conventional lithium ion batteries and allows for much higher power density, or rate of charge and discharge. The battery has the ability to recharge to 90% of its capacity in five minutes. 3000 Watts per Kilogram guarantees the highest performance in the smallest form factor.

The new cell, which for the first time uses a nanophosphate positive electrode (cathode), has a nominal capacity and voltage of 2.3 Ah, 3.3V. The internal impedance (1kHz AC) is 8 mΩ typical. Maximum continuous discharge is 70A and pulse discharge at 10 sec is 120A for each cell. With an operating temperature range of -30°C to +60°C, the ANR26650M1 allows for use in harsh environmental conditions. A123 nanophosphate lithium-ion high-performance cells do not use any toxic heavy metals and

are therefore, in contrast to nickel cadmium cells, particularly environmentally friendly. Due to the use of thermally stable, non-combustible active materials, the ANR26650M1 cell offers a high level of safety, even without additional protection circuitry. This feature is a significant distinction compared with conventional cobalt-based lithium ion cells. Because nanophosphate lithium-ion cells do not require any protection components, this allows future high performance rechargeable batteries

to be manufactured much simpler than in the past and therefore, also makes them suitable for low volume production quantities.



+49 711 78336-122
batteries@msc-ge.com
Response number 116



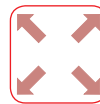
Personal Profile of Rüdiger Senghaas – Gleichmann Electronics GmbH

Since 2004
Gleichmann, Stuttgart
FAE NEC Microcontroller

Since 2006
Gleichmann, Stuttgart
Initiative Industrial
Automation; Marketing
and Application HMS

- Gleichmann**
- Get well known as solution partner in the industrial automation area
 - Push Industrial Automation Initiative at Gleichmann
 - Increase our partnership with TMG and HMS

- Personal**
- Age: 28
 - Not married
 - Food: pizza
- Hobbies**
- Music
 - Model airplane flying



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Our Commitment to Support

Please send me more information about:

- 8/32-bit Microcontroller and Tools
- SOC Light + (ARM based ASSPs)
- TFTs/LCDs
- Power Mosfet
- Optocoupler
- Discrete Products
- ASICs
- RF (Radio Frequency)
- Gleichmann Linecard

Please send me detailed information about the following microcontroller topics:

- Low Pin Count
- Building Management
- Motor Control
- Industrial Automation
- Health Care
- _____



NEC

Please copy and fax to +49 7249 910-328

Name/Surname	
Company	
Department	
Address	
ZIP/City	
Phone	
Fax	
E-mail	
Position	
Branch	
Company Size	

Gleichmann Sales Offices
 Headoffice Frankenthal
 Tel. +49 6233 347-0
 Frankenthal@msc-ge.com

Düsseldorf
 Tel. +49 211 92594-0
 Duesseldorf@msc-ge.com

Eching
 Tel. +49 8165 9995-600
 GADE@msc-ge.com

Munich
 Tel. +49 89 945532-60
 GE.Muenchen@msc-ge.com

Stutensee
 Tel. +49 7249 910-0
 Stutensee@msc-ge.com

Stuttgart
 Tel. +49 711 78336-0
 Stuttgart@msc-ge.com

Gleichmann Electronics
 UK Limited
 Tel. +44 1908 399770
 Miltonkeynes@msc-ge.com

Gleichmann Electronics Belgium
 Tel. +32 2 452 64 51
 Belgium@msc-ge.com

Gleichmann Ultratec AG
 Tel. +41 43 355 33 66
 info@ge-ultratec.ch

Gleichmann Electronics Turkey
 Tel. +90 216 411-2333
 Turkey@msc-ge.com

Gleichmann Electronics CZ s.r.o.
 Tel. +420 516 411 494-15
 Blansko@msc-ge.com

Our products are also available through our sister company MSC

Berlin
 Tel. +49 30 720089-0
 Berlin@msc-ge.com

Hamburg
 Tel. +49 4106 7764-0
 Hamburg@msc-ge.com

Hannover
 Tel. +49 511 616847-0
 Hannover@msc-ge.com

Jena
 Tel. +49 3641 6825-0
 Jena@msc-ge.com

Wiesbaden
 Tel. +49 611 97320-0
 Wiesbaden@msc-ge.com

Nuremberg
 Tel. +49 911 43970-0
 Nuernberg@msc-ge.com

MSC Vertriebs GmbH
 Wiener Neudorf
 Tel. +43 2236 205066-0
 Wien@msc-ge.com

MSC Schweiz AG
 Tel. +41 21 965 3500
 Montreux@msc-ge.com

Tel. +41 41 785 8200
 Rotkreuz@msc-ge.com

MSC-Vertriebs-CZ s.r.o.
 Tel. +420 296 580260
 Praha@msc-ge.com

MSC Iberia S.L.
 Tel. +34 935 824 445
 iberia@msc-ge.com

MSC (France) S.A.R.L.
 Tel. +33 16480 5555
 Paris@msc-ge.com

MSC Budapest Kft.
 Tel. +36 1250 90-40
 Budapest@msc-ge.com

MSC Nederland BV
 Tel. +31 78 6920-150
 Netherlands@msc-ge.com

MSC Polska Sp. z o.o.
 Tel. +48 323 3054-50
 Gliwice@msc-ge.com

MSC-Mibatron s.r.l.
 Tel. +40 31 102 34 66
 +40 21 230 25 30
 Bucuresti@msc-ge.com



Contact your regional sales office