

The winners of the last competition in Edition 14:

1st–10th prize:

- A. J. H. Berkers, Van der Lande Industries AG, Veghel, Netherlands
- Dr Drasto, MikromatWerkzeugmaschinenfabrik GmbH, Dresden, Germany
- Oliver Fey, H. Kleinknecht & Co. GmbH, Siegen, Germany
- Per Göransson, Motoman Robotics, Kalmar, Sweden
- Thomas Lohmann, KHS Kisters Maschinenbau GmbH, Bad Arolsen, Germany
- Uwe Peters, tesa Werk Harrislee GmbH, Harrislee, Germany
- Thomas Rünchstroer, Karl Menzel Maschinenfabrik GmbH & Co, Bielefeld, Germany
- Paul Rodgers, Microdat Tusker Ltd., Leeds, United Kingdom
- Wolfgang Schad, WAFIOS AG, Reutlingen, Germany
- Alexander Thomalla, Erhardt & Leimer GmbH, Stadtbergen, Germany

The solution to the last competition in Edition 14:

	13	3	5	8	7	9	4	6
8	3	2	3	1	4	0	4	0
8	4	3	2	2	1	1	1	3
5	2	1	0	2	3	1	0	2
14	4	0	0	1	4	4	1	1
2	1	2	1	0	2	1	1	1
6	2	3	1	2	1	2	2	3
5	0	1	0	4	3	2	0	0
7	4	2	0	2	2	3	4	4

Trade fairs

Lenze AG is also taking part at several international trade fairs in 2005/2006. Why not pay us a visit?

Our complete Trade Fair Calendar can be found on our website at www.Lenze.de

PTC Asia 2005

Shanghai, China
28.11–1.12.2005

Manufacturing Indonesia 2005

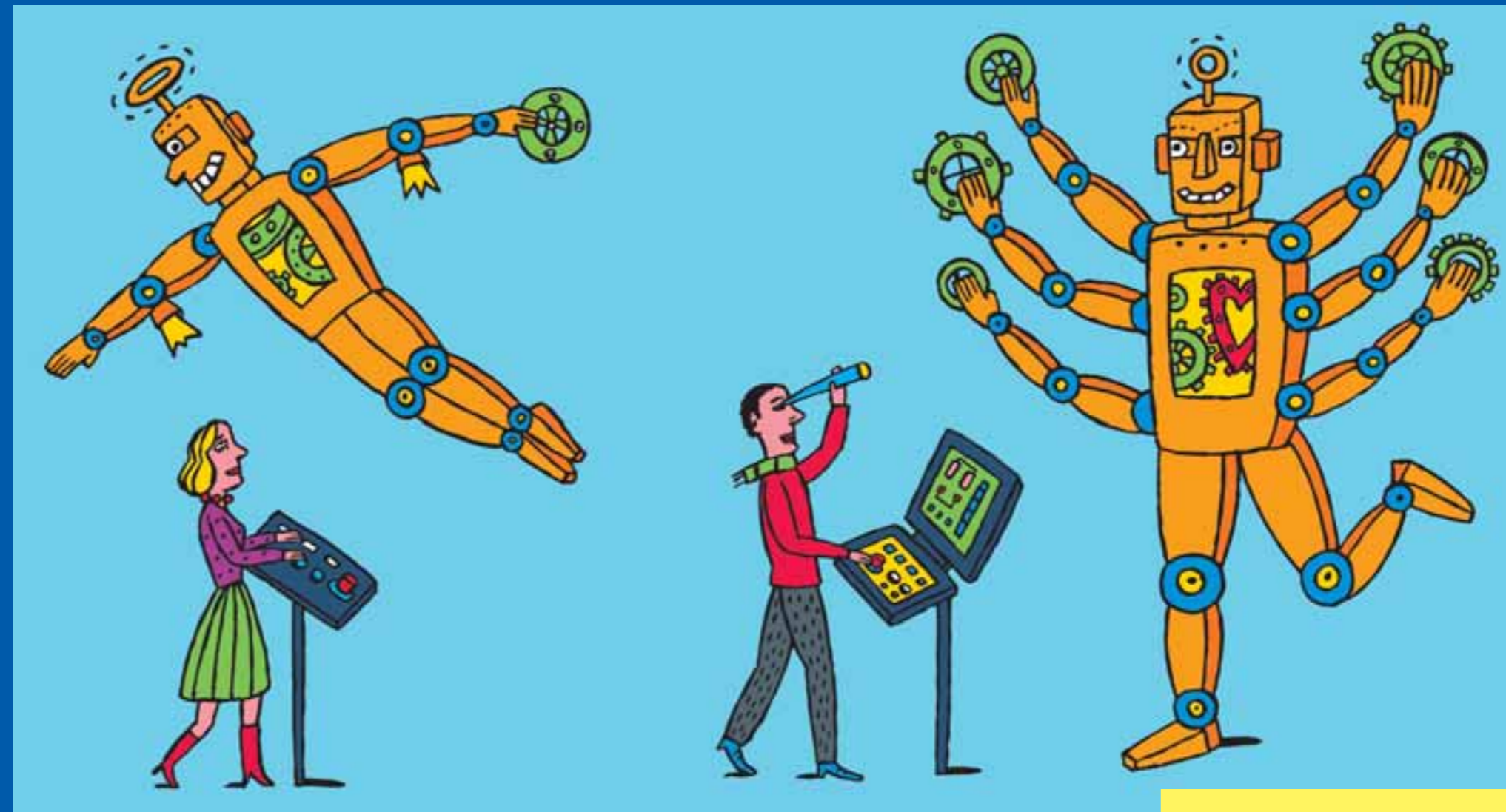
Jakarta, Indonesia
7–10.12.2005

ELECTRICX 2005

Cairo, Egypt
10–13.12.2005

Hannover Messe Industrie

Hanover, Germany
24–28.4.2006



www.Lenze.com

DriveIn

Lenze Group customer magazine

No. 15
2005

Cold water

Exemplary ecological project in Toronto

Waves from outer space

Driving radio telescopes in Italy

Scrumptious salmon

Servo controllers help to fillet fish

Full service

PC-based automation is now part of the Lenze portfolio

On your marks, **plug** and **play**



L-force Servo Drives 930 fluxxtorque

Are you ready for a winner? L-force Servo Drives 930 fluxxtorque are ahead of their class in the power category of up to 600 W. This decentralised unit comprising a motor and a servo converter saves space in control cabinets. Preassembled system wiring enables easy, quick installation, while intelligent interfaces enable direct communication with other systems. What are you waiting for?

Find out more at www.Lenze.com.



L-force | Your future is our drive

Who is sitting where?

In this issue, solve the puzzle of who has been given which seat at a conference. Send us your answer on a postcard, together with your address, or fax it, no later than 28 February 2006. We hope you enjoy working this one out!

First prize this time is a Japanese table-top grill. Discover the Far Eastern way of grilling: it's fat free and it doesn't smell. Using the electric Teppanyaki Grill you need neither fat nor oil, which makes table grilling a clean, low-calorie experience. We are also giving away four Mokka Express machines, the unique espresso maker with a patented twin-chamber system. Enjoy the lifestyle of Bella Italia!

You will find out whether you have won in the next issue of Driveln. Legal recourse is not allowed.

The task

The Hummingbird Group is the world's foremost ice cream flavouring manufacturer and is hosting an international sales conference in Kuala Lumpur. Its composition of cassia and South African baobab was the absolute top seller during last year's ice cream season. Hummingbird intends to repeat the experience, and is calling a Group meeting in foreign climes. Tasty ideas are needed that will tease taste buds the world over. Managing Director Alfredo Iceman is looking forward to the meeting. Unfortunately, someone forgot to arrange name badges for the delegates. His assistant, however, has prepared the following seating plan for him. Now Iceman must think hard. After all, he wants to address everyone by their proper name. Who is sitting where, and which country is each person representing?

Note: The titles of positions and jobs do not imply anything about the gender of the delegate.

Names: Ms Baobab, Ms Vanilla, Mr Cinnamon, Mr Almond, Mr Woodruff, Mr Noisette, Ms Chilly, Ms Summer, Ms Cherry

Countries: Denmark, England, France, Italy, Japan, Russia, Sweden, Spain, Turkey

1. The Sales Director for the Japan region is sitting in the same horizontal row as the colleague who speaks Danish, and somewhere to his right. Ms Chilly's seat is in the same vertical row as, but somewhere above, the Japanese expert.

2. Mr Noisette's seat is one horizontal row below the position of the Manager of the Spanish subsidiary, and one across to the right. The Spanish representative's seat number is higher than Mr Cinnamon's.

3. Ms Cherry's seat is somewhere below and to the left of the Russian Key Account Manager.

4. Ms Summer speaks Italian. Her seat is in the same horizontal row as the seat of the English Food Chemist, but somewhere to the left. Ms Vanilla is not sitting in that row, and has an even seat number. Mr Almond's seat is not in the same horizontal or the same vertical row as that of Ms Vanilla.

5. Mr Woodruff is sitting in the fourth seat, and the Salesperson on seat five speaks French.

6. Ms Baobab's seat is somewhere above and to the right of the Swedish Manager.

Competition

Company: _____

Name: _____

Street: _____

Postcode/Town: _____

Phone: _____

Fax: _____

E-mail: _____

Fax reply
+49 (0)5154 821 605

If you would like more information about the following articles, simply complete this form and return it to us.

- Management Report
 ETC control
 Remote maintenance
 Drive control Drive PLC

Lenze AG
 Thorsten Sienk
 Postfach 10 13 52
 31763 Hameln
 Germany

Enter the solution to the quiz here (name, country):

1	2	3	4	5	6	7	8	9



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*Dr. Erhard Tellbüscher,
Chief Executive Officer of Lenze AG:
"We are on the road to becoming a Full
Service Provider."*



Dear Reader,

Our company went on growing last year. Turnover rose by four per cent to €466 million. We are optimistic that we will continue our successful course over the current financial year and will remain a strong business partner.

We have usefully extended our product portfolio by means of an acquisition. The company Digitec Engineering, based in Meerbusch near Düsseldorf, is now part of the Lenze Group. Digitec has been specialising in the development and production of industrial PCs and related automation systems since the 1980s. So now, as well as drive-based automation, we also offer PC-based automation, hence the title of our cover story, "On the road to a full service", on page six. We have included an application report to tell you how Digitec PC-based controllers are used in the food industry.

Energy prizes are currently climbing to all-time highs. Our American subsidiary, AC Tech, has been involved in a project in Toronto in which office buildings are air-conditioned using lake water at four degrees Celsius. The energy savings are phenomenal: power consumption for cooling the buildings has fallen by 75% – an admirable result, and we are very pleased to have been part of it. In Italy our technology has been moving great things ever since we equipped a pair of 250-tonne radio telescopes with new drive technology. And when the bowls roll and the pins fall, we are there too. One of our clients builds bowling alleys that are in demand all over the world. Finally, we report from Iceland about how the latest technology helps to fillet salmon.

Happy reading!

Yours,

Dr. Erhard Tellbüscher
Chief Executive Officer of Lenze AG

Growth in turnover and earnings

We reasserted our position as a strong force in the mechanical engineering industry during the 2004/2005 financial year (1 May 2004 to 30 April 2005). The Lenze Group increased its operating earnings before interest and tax (EBIT) to €28.8 million (previous year: €25 million). Turnover rose by €18.4 million to €466.2 million, representing an increase of more than four per cent. We succeeded in countering the general price-pressure in the market by means of intensive sales activities and marked rationalisation measures.

The Lenze Group's main sales markets are in Europe. The German market holds a share of 39 per cent, while the rest of the European countries put together make up 48 per cent of total turnover.

Sales in the German market were especially pleasing over the past year, while the regions of USA and Asia remained below expectations.

Results after tax improved by 47 per cent (€5.6 million) to €17.6 million (previous year: €12 million). Our equity ratio rose to an excellent 55 per cent (previous year: 51 per cent). We managed once again to reduce our net financial debt, which was 8.4 per cent (previous year: 12.5 per cent) of the balance sheet total adjusted for cash resources. The average number of people employed by the Lenze Group fell slightly by one per cent to 2,986 (previous year: 3,014). The current financial year started well. Lenze is therefore confident of being able to continue its course of growth.



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Editors

Nicole Funck (responsible for the editorial content), Thorsten Sienk

Contributions to this edition by

Uwe Begemann, Peter Bisselink, Fabio Gamberale Paoletti, Egbert Gunia, Steffen Habermann, Anita Holland, Rainer Löwe, Oliver März, Ines Oppermann, Sylvia Sachon, Fritz Witte

Contact

Phone: +49 (0)5154 821 476

E-mail: Drivein@Lenze.de

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Managing innovation

In June, Lenze set up a Central Innovation Division. It is headed by Dr. Edwin Kiel. The new division's task is to create technical platforms from which our technology and portfolios are centrally coordinated for the five production companies of the Lenze Group. "In future we will be able to identify potential innovation more quickly, and turn it into a uniform product portfolio," explains Dr. Kiel. Innovation is one of Lenze's major success factors.

Leadership trio complete

Since August, Frank Maier has been the third Managing Director of Lenze Drive Systems GmbH, alongside Dr. Gisbert Schulze and Dr. Ulrich Uhlmann. Together they lead the largest company in the Lenze Group. The 42-year-old takes over the post from Dr. Edwin Kiel, who has since assumed other responsibilities within Lenze AG.

Maier is responsible for the development areas of electronics, mechanics, electro-mechanics and automation. As a qualified electrical engineer he began his career at Hewlett Packard (HP) in their measuring technology development division. He subsequently worked for HP in Germany and the USA, holding managerial positions until the measuring technology division was hived off, after which he worked for Agilent Technologies.



Frank Maier

Cold water for cool heads

The world's largest model ecological project for cooling office buildings in Toronto

Energy prices are currently at all-time highs, so every way of reducing costs is welcome. In Canada, a pioneering method has been developed for air-conditioning office buildings, leading to a 75 per cent fall in energy consumption. Now it is lake water which is keeping the heat off those working in the city's office buildings.

With more than two and a half million inhabitants, Toronto is Canada's biggest city and a commercial centre in which the summer months can be surprisingly hot. The offices, therefore, need cooling. As of late, a system has been in use which is both economical and environmentally friendly. To cool the buildings, it simply takes ice-cold water from a lake.

The capital of Ontario Province lies right on the shores of Lake Ontario. This is the smallest of North America's Great Lakes, but with an area of 19,000 square kilometres it is nevertheless 33 times bigger than Lake Geneva, Europe's largest Alpine lake.

Water at a temperature of four degrees Celsius is sucked up from a depth of 83 metres. Three five-kilometre-long pipes conduct the icy lake water into the city. Frequency inverters made by Lenze subsidiary AC Tech control the valves that regulate the throughflow and volume of water. Only if these control valves function reliably can the system work effectively.

In an Energy Transfer Station, stainless steel plate heat exchangers draw more than 90% of the chill from the water. This coldness is then passed on to a second closed system, from which it passes underground to the buildings, whose own air-conditioning heat exchangers are connected up to it. The warmed lake water is subsequently used as drinking water.

This project has reduced the electricity required to cool the buildings by 75 per cent. Twenty office buildings in the Toronto central business district are already being air-conditioned using this

method. The Toronto system is the world's largest lake water air-cooling system, and can cover 40% of the air-conditioning needs of office space in the city centre. It is run by the City of Toronto Water Supply Division together with local power supplier Enwave District Energy Ltd. According to Enwave's calculations the system reduces carbon dioxide emissions by around 40,000 tonnes per year – also good for the atmosphere.

www.enwave.com

Icy water from Lake Ontario cools office towers in central Toronto, saving 75 per cent of the power consumed by conventional air-conditioning systems.



On the road to a full service

Getting involved in PC-based automation – an interview with Pekka Paasivaara, member of Lenze’s Managing Board

Driveln: In May, Lenze AG took over Digitec Engineering GmbH from Meerbusch near Düsseldorf. The company specialises in industrial PCs and automation systems based on them. How does this business suit the Lenze Group?

Paasivaara: We acquired all of their shares, but it was a friendly takeover because Digitec is also benefiting from it. By belonging to the international Lenze Group the company now has access to our worldwide sales and service network, which is opening up new sales markets to them. To us, the acquisition was important because Digitec’s products are the ideal complement to our product portfolio. The previous managing directors and partners Detlev and Egbert Gunia continue to occupy their positions within the new Lenze Digitec Controls GmbH. Its management has been strengthened by Michael

Spicker, who as a Regional Director was responsible for Lenze’s business in North Rhine-Westphalia for seven years.

Driveln: How have your customers responded?



Paasivaara: They have sanctioned our decision. “Now we can get everything from one place,” is what they are saying. Our aim is to build up our systems business alongside our drive solutions activities – and that means the interplay between drive and control technology. So now, as well as drive-based automation, we also have Digitec’s PC-based automation inside our L-force system.

Driveln: What strategy are you pursuing with Lenze Digitec?

Paasivaara: It is our intention to market Digitec’s products more internationally. Up until now the company has only been well represented in the German-speaking world, which will change. Digitec’s industrial PCs will be immediately included in our distribution range; our sales companies are already attending sales and engineering training courses at Lenze-Digitec in Meerbusch. We will develop the PCMatic automation system further, so that in about two years we will be able to offer a complete system with logic and motion control features.

Driveln: Have you defined a new role for Lenze Digitec within your group of companies yet?

Paasivaara: Yes, naturally. Within the L-force family, the company will take over the PC-based area, from development and production, right through to marketing. Lenze Digitec will also continue to act independently in the traditional industrial PC market.

Driveln: How are you integrating Digitec into the Lenze Group?





Paasivaara: Their visualisation systems are very good. Digitec developed them in conjunction with a company called INOSOFT. The scalable INOSOFT system VisiWinNET complements the system perfectly, and will continue to play an important part in our close cooperative alliance.

tronic drive equipment, AC Technology Corporation, Uxbridge, which entered the Lenze Group right back in 1999. We allow the people in companies we have acquired over time to grow into the Lenze Group. It is also part of our culture to give new subsidiaries the necessary space.

Driveln: One final question – does Lenze have experience in the integration of other companies?

Paasivaara: At the moment we are working on harmonising interfaces and creating an overall system from the products of the two companies. PC-based automation technology shall be another major pillar of the Lenze Group from now on. Such a comprehensive product portfolio – Lenze drive technology and the Digitec components – places us in a unique position.

Paasivaara: In the past we have taken over other production companies whose product portfolios complemented our existing range well in order to achieve our strategic corporate objectives. I am referring to Lenze-Deto, which was formed in 2003 from Deto Technologie Trading, Kufstein, and which offers specialised solutions for the car industry and for conveyor engineering. Then there was the US manufacturer of elec-



Driveln: Let's talk about electronics. Are you interested solely in their industrial PC expertise, or also in other activities?

Paasivaara: We do not see ourselves as an industrial PC seller who is after big volumes. We want to sell automation solutions, for which we have chosen PCMatic Control. This is a Soft-PLC running under Windows CE, and it is programmed in the standardised languages of IEC-61131-3.



Driveln: Does the new company have anything else to offer?

Keeping the milk and yoghurt flowing

The computer and operator terminal unit are kept separate in difficult working environments / Aa application report from the food industry

How do you get condensed milk, cream cheese and yoghurt into their packaging? Very simple: by using special packaging machines for liquid and viscous foods. The company Gasti Verpackungsmaschinen GmbH is based in Schwäbisch Hall and offers a wide range of filling and closing machinery, and their specialised equipment incorporates industrial PC solutions from Lenze Digitec Controls.

Machines used in the food industry have to put up with a lot. Machines shake and squirt. Not everything stays clean. And of course, because of the strict hygiene regulations, the machines are frequently washed down. All in all, far from ideal conditions for the operation of a computer, which is why, in the past, the industrial PCs used for operating and monitoring the equipment have often broken down.

A significant improvement arrived in the form of a solution created together with Digitec. The visualisation system required by Gasti was developed in conjunction with the user. It employs impact-resistant, separate operating terminals with a high protection rating (IP65), which can withstand the cleaning procedures regularly required in the food industry, and the shaking that occurs during operation. The industrial PC itself is suspended safely in the control cabinet.



In the machines, individually adjustable pumps ensure constant dosing accuracy when filling the foods into their packages. Because the machines work continuously (the tubs move through at an even speed), the packaging is not subjected to any forces that could cause the contents to spill over. A constant speed is also maintained when the tubs are placed down onto the conveyor belts.

The operator terminal and the control cabinet PC are connected to the PLC via Ethernet TCP/IP. Lenze Digitec monitoring systems are used to ensure clear control of the functions and the easy rectification of faults, such as those that can occur when there are insufficient tubs on the line. The level of automation achieved in the machinery makes work much easier for the operating staff.

The Digitec product range includes, alongside the industrial PC solutions, all-in-one panel PCs and thin clients, as well as a wide selection of separate operating solutions combining a robust on-site monitor panel with an industrial PC installed in a control cabinet. This enables powerful PC-based operating systems to be set up near to the machines themselves.

Operating and monitoring solutions, together with industrial PCs from Lenze Digitec, are put to use in the food industry.

PC Automation: robust and powerful

Digitec has been developing and producing industrial PCs since 1986 and is one of Germany's pioneers in the field of PC-supported automation. The company has created a platform concept based on a largely standardised and modularised product range. This has reduced the costs of development and production, simplified the supply of spare parts, and enabled users to assemble the products they require individually.

The PCMatic automation system introduced in 2002 is based on panel PCs which are suited to a wide range of installation situations and for standalone use. PCMatic consists of powerful and robust industrial PCs, real-time compatible Windows operating systems, universal interfaces and universal communications protocols, all of which open up to users a diversity of possibilities when establishing their PC-based automation architecture. Different controllers and field bus systems, drives and operating components can easily be integrated. The system includes PCMatic-Control, a Soft-PLC based on the IEC-61131-3 standard (CoDeSys). The company also offers autonomous PLC coprocessor systems in the form of pluggable PC cards.

The PCMatic visualisation system VisiWinNET from INOSOFT is based on Microsoft's .Net Framework, which greatly simplifies the development of secure, stable visualisation applications. Integrated drivers and Ethernet linkage ensures universal data compatibility. Operation is near to the machinery, and system parameters can be accessed from the control desk or by the Internet. The system can also be connected to warehouse management systems and office applications. Digitec and the visualisation specialist INOSOFT GmbH work closely side by side.



The receiver is in the centre of the antenna dish. It receives the waves that have been concentrated and focused by the subreflector, and amplifies them. It is also there that the frequency range is selected. The data is then electronically recorded and evaluated.



What are radio telescopes for?

Galaxies look like static objects in the sky. In fact they are not at all static. The only thing is, no one has ever managed to prove that they move from Earth. Until now: astronomers have succeeded in measuring the movement of our neighbouring galaxy, which is known as M33 and is moving through space at a speed of 190 kilometres per second. To observe this, the astronomers linked up several radio telescopes that lay thousands of miles apart from one another, to form one giant telescope. Over a period of three years, the researchers measured the movement of water vapour clouds inside M33. These clouds emit radio

waves. The accuracy of the measurements was five micro arc seconds per year. As a comparison, this would show a movement of 0.01 millimetres per year from a distance of 500 kilometres. With that level of precision, you could see from London something moving a hair's breadth in the Southern Uplands of Scotland.

Radio telescopes also provide useful information about the Earth itself: they help to measure continental drift. It has been discovered, for instance, that Sicily is moving towards Central Europe.

www.mpifr-bonn.mpg.de

Waves from outer space

Servo drives turn 250-tonne radio telescopes

The universe is being explored with ever-increasing accuracy. Nowadays, huge radio telescopes are the precision tools of many astronomers.

Unlike optical telescopes, they can also work by day and they can even penetrate dense layers of gas and cloud. They make the universe visible and probe billions of light years into space.

In Medicina, Italy, near Bologna, and in Noto near Syracuse in Sicily, there are two radio telescopes equipped with Lenze drive systems. The two telescopes are identical in construction, having moving parabolic antennae with a 32-metre diameter. Both giant dishes can work separately, within a European net-

work, or in a worldwide grouping of radio telescopes. Several such telescopes can be connected together so that they function like one enormous antenna, so that even radio waves with long wavelengths and very distant objects can be observed.

The radio telescopes in Medicina and Noto have now been equipped with servo drive systems from Lenze so that they can home in even more precisely on cosmic radio sources. Absolute precision and reliability is needed to move the 250-tonne behemoth around its main axis; the most minute discrepancies in movement give rise to errors in measurement – especially when working in conjunction with other radio telescopes. The servo drives have significantly

improved the positioning and handling of the axes. A specially designed dual motor system with torque sharing reduces the play in the main axes. The dish has to rotate very slowly in order to track a radio source in space. The geared motors turn the drive shaft just one tenth of a revolution per minute, which moves the 250 tonnes of steel at a snail's pace.

Who's broadcasting from outer space?

Common cosmic radio sources are hot gas clouds, supernova relicts, neutron stars, quasars (quasi-stellar objects) and pulsars. The visible light stars are usually only weak sources of radio waves. Electromagnetic radiation in the radio wave range (from 0.35 millimetres up to about 15 metres) is continuously bombarding Earth from space.

Right: radio waves from space are billions of times weaker than signals emitted by terrestrial sources. Radio telescopes are therefore normally situated in sparsely populated and largely interference-free regions of the Earth.



Bowling in Havana

Automation picks the pins up quicker

Bowling comes from the USA. But like many things, its earliest origins are European. And it is enjoying rising popularity all over the world, both as a leisure activity and as a competitive sport. The most technically ingenious bowling alleys, however, are made in Germany.

Games with skittles can be traced back to the twelfth century in Europe. As a game of the masses, it not only awakened a competitive spirit but also led to frequent scuffles, leading to periodic banning over the course of the centuries. Skittles did not become socially acceptable until the end of the seventeenth century, when even the German poets Schiller and Goethe are said to have amused themselves playing the game. In 1786 the Berlin physician and scholar Johann Georg Krünitz wrote his “13 Rules for the Game of Skittles”, which are still in use today.

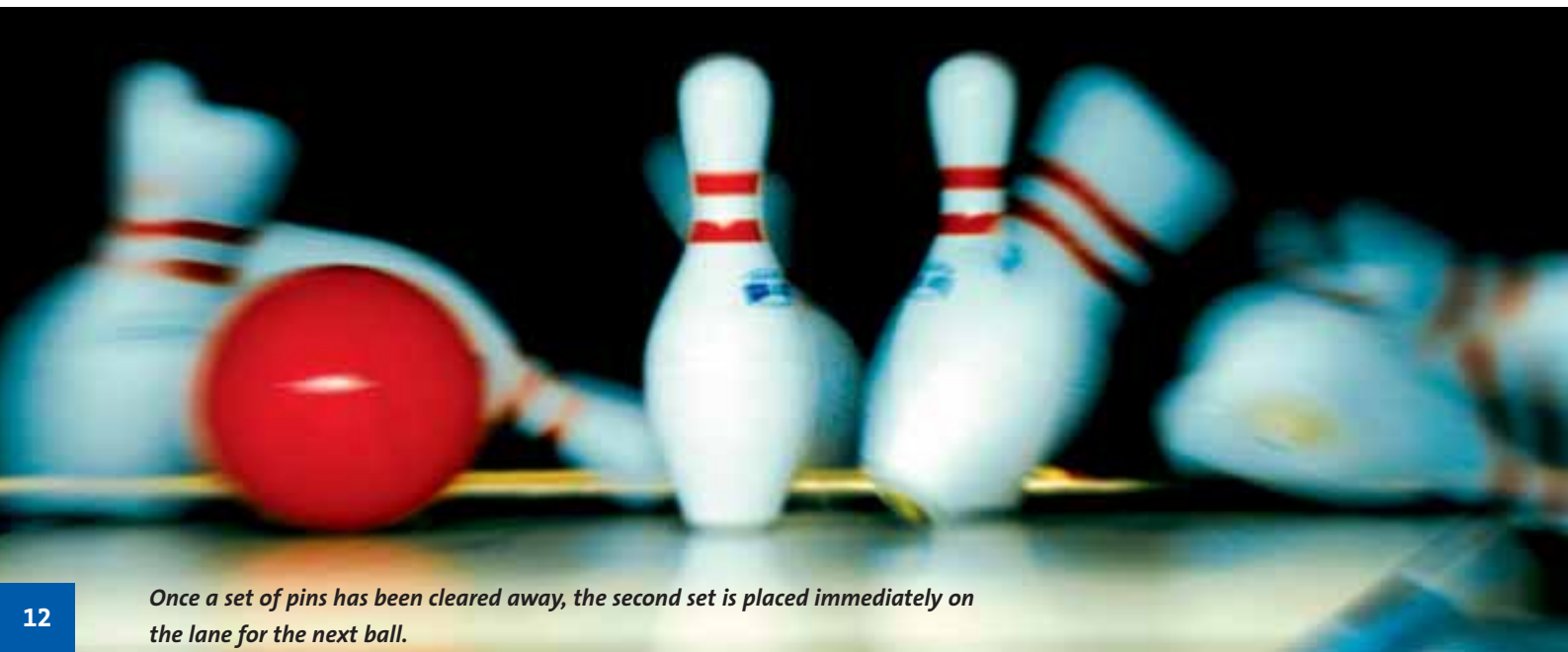
Settlers from southern Germany brought the game of ninepins to North America. There it was often played for high stakes, and some enthusiasts lost everything they owned. Consequently a ban was soon imposed on the game in the New World as it had been in Old Europe. But resourceful players were not perturbed: they simply added a tenth pin. Thus bowling was born.

The principal objective in bowling is to knock over all ten pins at the end of a 20 metre-long alley using a ball – if possible in one go. Knocking them down in one is known as a strike.

The first world bowling championship was held in Sweden in 1925. The same year, the first bowling alley was installed in Germany. Today, competitions may only be played on cable-free systems. In modern alleys the pins are no longer set up using cables as in skittles, but using modern technology instead.

Karl Funk GmbH & Co. KG, based in Maselheim near Biberach an der Riß, is the only company in Europe to manufacture these systems. Funk alleys are considered the fastest available. They have been approved by the American Bowling Congress, and are internationally certified for competition use. Each lane has two sets of pins in play. Once one set of pins has been cleared away, the second is immediately set up. The speed at which the pins are changed is a special feature of Funk alleys, and with Lenze automation technology, up to ten games can be played, each of ten sets, per hour.

Funk bowling alleys incorporate nine drives. Motors with various outputs and gearings drive the cup conveyors, conveyor and belt drives, pin distributors, ball accelerators, ball lifters, placers, clearers and a distributor plate. The conveyor belt is driven by an SDS motor with worm gearing from Lenze. A com-



Once a set of pins has been cleared away, the second set is placed immediately on the lane for the next ball.

bined three-phase motor and bevel gearing from Lenze's GKR series moves the belt plate which continuously conveys the fallen pins to the cup conveyor. All of the motors are protected by contactors which are controlled by the Lenze Drive PLC. The Drive PLC stores the alley's entire procedural control sequence.

The "Phönix" bowling centre was opened in summer 2005 in Fürth, and operates 22 Funk lanes, each of which is made autonomous by its own drive controller. For example, if a pin gets stuck in one lane, it switches off automatically before serious damage is caused to the mechanical components. In the event of a fault, a technician can immediately log into the lane's control system using the

Lenze Handheld HMI 605 and the CANBus. The other lanes keep on working unaffected. "Players pay money when they come here. No operator can afford to have the whole place come to a standstill just because a pin is stuck somewhere on lane eight," explains Karl-Heinz Funk, Managing Director of Karl Funk GmbH & Co. KG.

Algeria, China, Kuwait, Libya, Mexico, Nigeria and the USA – people bowl on his alleys all over the world. A system with 24 lanes is soon to be delivered to Havana, the capital city of Cuba. "We have to minimise our fitters' travelling expenses. We can hardly justify a flight to Cuba just to do 45 minutes' work if a fault could be resolved quickly using

modern communications methods," says Funk.

This is where remote diagnosis comes in. The new ModemCAN 2181 from Lenze is approved for use in many countries of the world, and it enables global remote maintenance via analogue telephone networks. If necessary, an external modem (ISDN or GSM for example) can be connected. The ModemCAN 2181 has a call-back function and password protection so that no one can gain unauthorised access to the system.

To the Funk company it was important to find an ally for its drive and control technology who was similarly represented throughout the world. By working with Lenze they have succeeded in developing bowling alleys that have a considerable edge over their international rivals. "We managed to complete the systems with the very latest technology in the shortest possible time," says Funk with enthusiasm.

www.funk-bowling.de

An SDS motor, combined with a worm gear, transports a pin to the distributor plate.



Salmon in a hurry

High-tech machinery from Iceland processes fish

Fish is trendy. Germans eat an average of 14 kilos of fish per year. The Spanish and Norwegians manage almost 50 kilograms. But top of the list – ahead of Japan even, with their 80 kilos – comes Iceland. Every Icelander consumes an average of more than 90 kilograms of fish each year.

No wonder, then, that Iceland does a strong line in fish processing technology. The Icelandic company Marel hf was founded in Reykjavik in 1983, and has been represented in Germany since 2001. Marel specialises in processing machinery for the food industry, and the focus of its range is on machines for the fully automatic processing of fish, poultry and meat.

Their latest development is known as the Trimming Machine. The Type ITM III system processes salmon flanks quickly and carefully. It determines which

parts of the fish are to be processed further and can be passed on to the consumer, and which parts have to be thrown away because they are of insufficient quality.

To do this job, the ITM III is fitted with a camera system which can measure up to 20 filleted salmon sides per minute, and automatically sort them into quality categories. When this information has been gathered and passed on to the controller via a fast Ethernet connection – that is the point at which Lenze technology steps in.

The ETC motion controller converts the information precisely and at lightning speed into the necessary movements. On the drive side, as many as twelve ECS servo controllers work in the machine in combination with synchronous servo motors from the MCS series. Decentralised I/O modules are used to import and control additional switching signals.

Using the camera data, the controller calculates in a matter of microseconds the track along which the cutting blade must run. The drive data is sent via the system's internal CAN-Bus to the ECS

servo controller. The result is a perfectly filleted, kitchen-ready piece of fish without any unwanted bones or torn edges, the sight of which is enough to make any fish lover's mouth water!

www.marel.com



Salmon is healthy: it is rich in essential polyunsaturated fatty acids.



For the perfect piece of fish: after the salmon side has been measured, a rotating blade proceeds with precision along the calculated contours.



Icelandic exactitude: the Trimming Machine from Marel processes salmon sides efficiently and gently.

On salmon and other fish

Salmon is currently enjoying great popularity. Fish is a highly nutritious food containing valuable protein, vitamins, minerals and trace elements. No other natural food contains so much iodine. The fat in fish is rich in essential polyunsaturated fatty acids.

In Germany, the home of Lenze, sea fish are the most popular, and top among them is the reasonably priced Alaska Pollock, whose German name is “Seelachs” or sea-salmon, although in fact it is not related to the salmon at all, belonging instead to the cod family. This is followed in popularity by herring and tuna. Salmon comes in fourth place, and is categorised as a freshwater fish. Most of the salmon we eat comes from fish farms. Wild salmon varieties are threatened with extinction.

The Atlantic salmon (*salmo salar*) can grow up to 1.5 metres in length and lives largely in the Atlantic Ocean. However, these predators have an extraordinary sense of direction which they use to return to their place of birth in order to spawn, far upstream in the rivers of Europe and North America. They generally succeed in coming to within ten metres of the site where they hatched.

In the nineteenth century there was still an abundance of salmon in our rivers. Increasing industrialisation, and with it the dumping of greater and greater amounts of harmful substances into the rivers, put an end to that. People have been trying for some years to enable these creatures to return to the rivers, but for salmon to re-inhabit a place the water quality has to be right.

Furthermore, the flora and fauna originally native to the river which the fish needs to live, also has to be restored. Fish ladders have to be built to surpass obstacles, and spawning grounds have to be available.

Salmon fry have been released in a Rhine tributary since 1986, in the hope that one day, after their several years of wandering the oceans, they would return. In the early 1990s they did indeed begin to come back – and the number has increased ever since. By the end of 2004, a total of 2,450 salmon had been verifiably proven to have returned to the Rhine and its tributaries.

Ultrasound in the bakery

Innovative machine for cutting cake

A cautious index finger runs along the steel blade, just to check. Not at all as sharp as one might have thought. Yet the 30-centimetre-long knife cuts cake cleanly, without cracked edges, thirty times a minute. The machinery made by BAKON food equipment in Goes, a town in the Dutch region of Seeland, is highly automated and equipped with Lenze technology. The company supplies machines to the baking industry worldwide. The secret of this particular cutting machine for tray-baked cake is ultrasound, which makes the blade vibrate at 20,000 oscillations per second.

Today a client from the UK is visiting BAKON. He has brought his own chocolate and cinnamon cake along for a test cut. A conveyor belt brings the cake to the correct cutting position. The baking

tray halts beneath the ultrasound knife. It is aligned precisely and fixed in place during cutting. The blade is mounted on a servo drive bridge above the conveyor belt. The servo drive adjusts the blade, bringing it to each cutting position and enabling the cake to be divided up however you want. Simply enter the required cake measurement into a touchscreen display. After cutting, the conveyor belt transports the baking tray and cut cake out of the machine. Finished. “Why do you use Lenze?” Without pausing long to think, Ronald Gijssel, Technical Director at BAKON, lists several reasons: long-standing partnership, good products, worldwide service.

And why do large-scale bakeries buy their machines from BAKON? “Production in conventional bakeries and in food fac-

ories is becoming more and more automated. Added to that, no human being can cut a cake as quickly and precisely as our ultrasound machine,” explains Gijssel. A fact which the British client is unable to deny. He orders the machine.



The secret is ultrasound, which makes the blade vibrate at 20,000 oscillations per second.



Smooth edges and precise portions with the aid of Lenze technology.

Decentralised controlling and starting

Indispensable helpers in conveyor technology

Integrated safety technology, easy installation, robust construction, high protection levels, and a range of features that includes independently assuming PLC tasks – Lenze has continued to develop its LCU (Local Control Unit) decentralised motor controllers. The LCU is available as a motor starter for fixed speed motors, and as a frequency inverter for variable speed operation. It is used mainly for conveyor engineering, especially in the car industry. The two versions of the LCU series are members of the “Decentralised Drives & Controllers” area of L-force, the new generation of drive and automation technology from Lenze.

The LCU starter covers motor outputs of between 1.5 and 3.0 kilowatts. The robust cast aluminium housing, protection level IP54, enables the unit to be fit-

ted near to the motor and outside the control cabinet. The connection technology is entirely pluggable, which improves installation and makes maintenance easier. Comprehensive status messages on a four-line text display and indicator LEDs simplify servicing and diagnosis. The triple-lockable service switch guarantees the safety of the maintenance technicians.

The LCU starter is available as a reversing starter or for dual motor operation. Electronic switches (Triacs) are responsible for the wear-free switching of the motor. A soft start-up using phase control means run profiles that are easy on mechanical elements and materials – for roller conveyors, rotary tables and skid conveyors, for example.

The LCU starter follows the L-force concept, which integrates safety technology into the drives as “Drive-based Safety”. The “Safe protection against restart” function satisfies the IEC 61508 (SIL 3) standard. The units communicate via Profisafe and have a brake controller, secure inputs and outputs, and all-pole disconnection which interrupts all phases mechanically from the 400 volt mains.

Lenze created the frequency inverter version using the same structural concept. The LCU inverter is tailored for motor outputs between 0.75 and 3.0 kilowatts, and is used in systems such as lifts, rotary tables and scissor-type lifting tables. The LCU inverter works in two optional operating modes: without feedback, or as a closed-loop unit in combination with encoders or resolvers. The scope of its features can be chosen by means of software modules, according to the application in hand. The portfolio ranges from simple speed regulation, to movement functions, to Soft-PLC, programmable in the languages of IEC 61131-3.



The LCU starter is available as a reversing starter or for dual motor operation.

Combined knowledge on DVD

Online support data is not available offline

The Application Knowledge Base has existed for three years now. Internet-based, it enables you to find out interesting facts and specialised user information relating to our products. But should the Internet be unavailable, we can help with the "Application Knowledge Base Offline Reader", which provides our entire database for offline use. You will find a copy of the DVD on this page. To start its installation, simply click on the file called "setup.exe".

Benefits of the Application Knowledge Base at a glance:

- ▶ Available worldwide through the Internet
- ▶ Entirely up to date
- ▶ Two languages: German/English
- ▶ Immediate self-help for users
- ▶ Combined application knowledge of Lenze experts

Contents of the Application Knowledge Base:

- ▶ FAQs and tips about how to use our products
- ▶ Information about extending functions – for software products, for instance

- ▶ Free software, updates and the latest drivers for downloading
- ▶ Comprehensive glossary with terms from drive and automation technology
- ▶ Information about known functional restrictions and how to resolve them
- ▶ Simple, fast search engine

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