

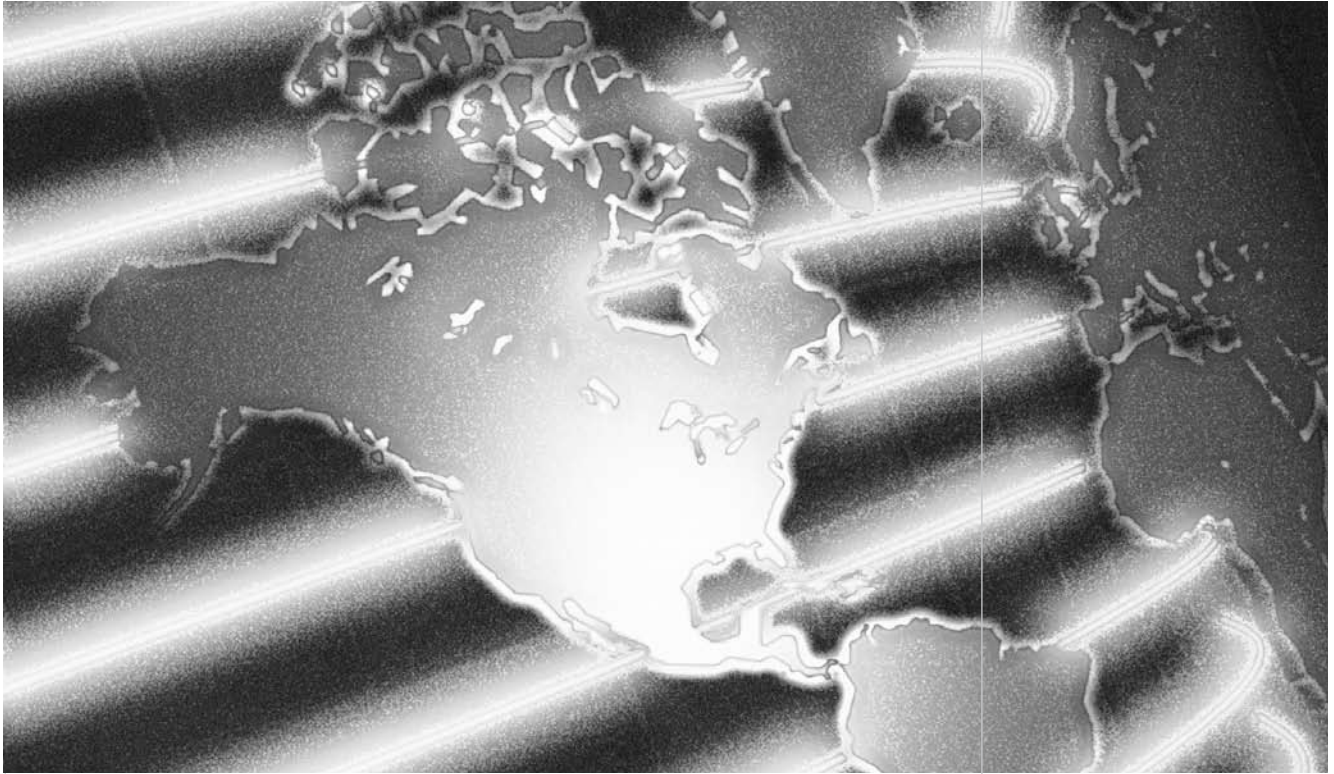
LUSTtec

No. 17
April 2006

■ Not only the tulips come
from Holland, ...

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Succeeding ethically and commercially

[Ethics relates to matters of moral values and norms. One well-known statement in this regard is Kant's Categorical Imperative: „Act only according to that maxim whereby you can at the same time will that it should become a universal law“ .]

However, commercial activity in the modern-day world – including in Germany – is subject to ever-increasing pressures to maximize shareholder value, reflected in often narrowly focussed corporate decision-making aimed solely at short-term attainment of that end. By contrast, a culture aimed at succeeding both ethically and commercially combines moral/ethical values and resultant maxims for action with long-term maximizing of profits, long-term sustainability of the business, and long-term enhancement of value for all involved (stakehol-

der value). We are committed to that goal.

The basic prerequisite for succeeding both ethically and commercially is responsible, committed, trusting interaction between all parties.

For us, responsibility, trust and commitment means ...

with regard to the customer: We aim to offer our customers the best, most cost-effective solution, delivering top quality without compromise. Our customers can rely on us.

with regard to our employees: We aim to develop, encourage and challenge our employees. We assign them responsibility and allow them the space to develop innovation and creativity. The common will to succeed unites us and creates mutual trust.

with regard to the company: We aim to safeguard existing jobs and create new jobs. We accept social responsibility and promote and encourage voluntary social commitment. Our efforts in the field of environmental protection are made out of conviction.

Although we are subject to ever-increasing social pressures, we do not deploy ethics and morality as a „cure-all“ to enhance our own reputation. Rather, we invest consciously in the conditions which promote collaboration for mutual benefit. In this way, we establish a corporate culture which makes us strong.

And we are proud of that!



Dr. Wolfgang Lust

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Not only the tulips come from Holland, ...

[When we think of flowers and plants we automatically think of the Netherlands. The Aalsmeer flower auction centre is the Wall Street for flowers. Some 1.7 billion flowers are distributed from the Aalsmeer hub every year, to destinations all over the world. The planting, potting, repotting and sorting of these unimaginable quantities is handled by state-of-the-art machinery which likewise originates from the Netherlands.]



Electro Abi based in Harlem – a motor manufacturer and LUST distributor in the Netherlands– has developed motors with an integrated encoder system for a fully automated transplanting machine. These motors are moved on the X and Z axes by c-line DRIVES from LUST.

Transplanting involves moving seedlings which are too close together further apart, so as to promote root propagation and enabling weaker plants to be weeded out.

In fully automated transplanting, a tray of plant material is automatically fed into the machine by way of a loader system employing the CDA3000 inverter system. When the tray is at the stipulated position, the plant grippers execute a sideways movement to pick the plants from the tray. At the same time, and fully synchronized with the pick from above,

the plants are pressed out of the tray from below by a studded bar. This device means plants with greater or smaller numbers of roots can be processed without problem, and without damaging the plants. Each plant gripper is controlled by an individual microprocessor with the associated CDD3000 servocontroller from LUST. By the optimal application of the servo technology, the machine can plant in various preset configurations. Pre-entered programs and settings can be saved and retrieved from the memory for later use.

Small and medium-sized machines transplant 3,000 to 16,000 plants per hour. Large machines can transplant up to 50,000 plants per hour.

Frequency inverters or servo drives are required, depending on the dynamic requirements. Within a machine, the LUST c-line DRIVES CDD3000 servocon-

trollers and CDA3000 frequency inverters move the plants. The servo movement is coordinated by the CANopen bus. A key benefit is that the c-line DRIVES provide unified operation for all motors.

*Jens Thielmann
Lust Antriebstechnik GmbH*

*Adrie Kreeft
Electro Abi b.v., Harlem,
Netherlands
www.abi.nl*

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Lust Servosistemi in Milan



[In January 2006 LUST opened a sales and applications engineering office in Italy.]

In Aldo Bucci and Gianluca Mangialardo, we were able to recruit two office managers with many years' experience in drive and servo system sales and applications. Lust Servosistemi now offers our Italian customers the closest possible attention to their sales and service needs.

The new office is located close to the new Milan exhibition centre, and so also right at the heart of the technology centre for the Italian market.

After having established a branch office with a service and repair centre in Shanghai in early 2005, the Milan office is a further step in developing LUST's international market operations.

*Jens Thielmann
Lust Antriebstechnik GmbH*

*Gianluca Mangialardo, Aldo Bucci
Lust Servosistemi srl, Milan*

First showing of Lust Servosistemi in Italy

[At the end of February Lust Servosistemi exhibited its wares at the Motion Control trade fair MC4 in Bologna. The show is small but high-quality.]

This first public showing was an immediate hit for LUST. Some 150 visitors attended the presentation by Gianluca Mangialardo at the conference held in parallel with the show. He set out the outstanding control properties of the c-line DRIVES series, detailing the GPOC (Gain Phase Offset Correction) method of compensating for encoder errors, and also looked at the prospects for the future of drive engineering.

There was a constant flow of visitors to the company's stand. „At last LUST is now in Italy too“, some visitors commented. „LUST had so many visitors that we barely had chance to photograph the stand“, was the report from the show's manager. Customers were impressed by the wide reach of the product series. Many had already got their eyes on the ServoOne, the new servo generation. Others were thrilled by the dimensions of the 37 kW unit, or were looking for quotes for direct drives.

Lust Servosistemi is sure to be showing at the next MC4. Arrivederci.

*Jens Thielmann
Lust Antriebstechnik GmbH*



[From left: Jens Thielmann, Gianluca Mangialardo, Aldo Bucci]

On course for expansion

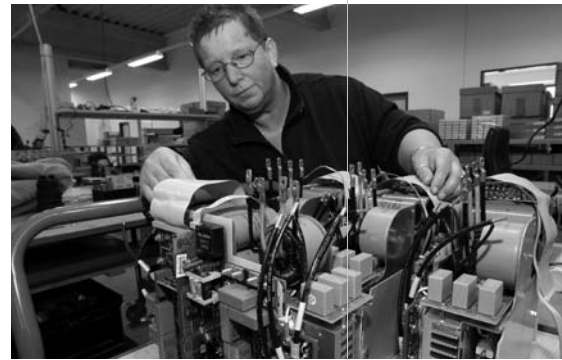


[Shortly before the end of the year, Lust DriveTronics GmbH moved into its new facility in Heinrich-Hertz-Strasse in Unna.]

After just six months under construction, a new 4,000 square metre industrial facility, featuring a manufacturing hall and offices, was commissioned into operation on the 10,000 square metre site on the Industriepark Ost industrial estate in Unna.

Production, sales and distribution, development and administration resources had to be topped up in order to cope with the increased sales volumes, larger workforce and logistical demands of the new facility.

Following an overnight move in December, the company's engineers, technicians and commercial staff are now permanently based at the new company headquarters. However, the healthy state of LUST's order books means that the demand for space in Unna continues to rise, and capacities in the newly-opened production and warehousing facilities are already stretched.



New Key Account Manager at Lust DriveTronics



[Since January 1st the Renewable Energies sales team has been strengthened by the addition of Jochen Heuvel.]

With his many years' experience in energy plants and his drive and servo engineering know-how, Mr. Heuvel is an expert point of contact for our customers in all matters relating to renewable energies and drive engineering.

His primary role will be to safeguard competitive advantages for our customers and to win new customers.

We would like to take this opportunity to once again welcome Mr. Heuvel most sincerely to our team, and wish him every success in meeting his new challenges.

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More parking for trucks with the ParkMax traffic sensor



[Since September 2005, at the Montabaur service station on Germany's A3 motorway, a system has been undergoing testing on behalf of the Ministry of Transport of the state of Rhineland-Pfalz which increases the site's truck parking capacity from 42 to 84 based on telematically controlled parking. The core of the parking space detection system is the ParkMax traffic sensor from Mechatronic, featuring the MF1B magneto-resistive (MR) magnetic field sensor from Sensitec.]

Truck drivers do not have an easy job, so being able to find a parking space more quickly is important to them. On major routes, in particular, motorway services are often hopelessly overfull, resulting in drivers parking their trucks outside of the marked areas, in through-route lanes or access areas, or even on demarcated acceleration and slowing sections or in car parking areas. At the entrances to the services, especially, the often unlit trucks pose a major hazard to other incoming vehicles.

And the situation will not improve as traffic volumes continually rise. Building new parking is a lengthy and cost-intensive process however.

The Ministry of Transport of Rhineland-Pfalz has thus laun-

ched a pilot project designated „Intelligent Parking“, aimed at providing some short-term relief. At the entrance point to the parking areas of the Montabaur services a terminal and barrier have been installed. When a truck driver arrives at the parking area, he enters on the terminal the time when he is intending to move on. He is then assigned a parking space behind a truck scheduled to leave shortly before him.

Depending on their length, between three and five trucks can thus be parked one behind the other, thereby making optimum use of the available space.

The project was developed by „Manns Ingenieure Dr. Manns + Conrad GmbH“. For parking space detection 333 ParkMax traffic sensors from Mechatronic, featuring 666 Sensitec

MF1B MR sensors, are installed. The magnetic field sensor signals all free spaces to the system. The highly sensitive traffic sensor detects the distortion of the terrestrial magnetic field caused by parking vehicles, evaluates it, and so is able to signal whether parking spaces are available.

Following successful testing, it will be possible to equip more service stations with this telematic parking system within a short space of time. And the system can be expanded further: If multiple sites along a stretch of motorway were interlinked by a parking guidance system, truck drivers could get up-to-the-minute information on the latest parking situation, from information boards, over their mobile phones or through their



satellite navigation systems for example, and be guided directly to a free parking space. Even prior booking is conceivable.

*Alfred Victor
Sensitec GmbH*

*With the kind assistance of
Mechatronic AG, Darmstadt
www.mechatronic.de*



[From left: Mr. Rüdiger, Siemens; Mr. Müller, Siemens; Mr. Dr. Bedenbender; Ms. Lust; Ms. Vogel]










Lust Antriebstechnik GmbH again voted Supplier of the Year

[Every year, the Siemens Medical Technology division in Forchheim assesses all its major suppliers according to numerous criteria in the areas of logistics, quality, development and management, rewarding its top overall performers. In financial 2004/2005 LUST once again demonstrated its strength in those areas.]

As in 2002/2003, the outstanding appraisal by Siemens once again brought LUST the title of Supplier of the Year. At a ceremony held at the Siemens plant in Forchheim, a certificate and trophy were handed over to Ms. Karin Lust (Prokurist/Director of the company), Ms. Christiane Vogel (Key Account Manager) and Mr. Dr. Heinz Bedenbender (Head of Quality Management). „Success of this kind can only be achieved by an innovative, efficient and committed team, working closely together, and that is what makes Lust Antriebstechnik, as a family business, so unique. This award provides us with a further incentive for the future“, commented Karin Lust proudly.

*Christiane Vogel
Lust Antriebstechnik GmbH*

LUST at fairs

Fair	Date/Location	Exhibitor
 Hannover Messe World Fair for Technology, Innovation and Automation www.hannovermesse.de	24th to 28th April 2006 hall 14, stand L05 Hanover	Lust Antriebstechnik GmbH Lust DriveTronics GmbH Levitec GmbH
 IAC, TME, SENSOR CHINA 2006 International Exhibition for Sensorics, Measuring and Testing Technologies www.ama-zentren.de	11th to 13th May 2006 stand D036 Shanghai-China	Lust Servo Systems, China
 WindEnergy International Trade Fair for windenergy www.hamburg-messe.de	16th to 19th May 2006 hall A2, stand 500 Hamburg	Lust DriveTronics GmbH
 SENSOR+TEST 2006 The Measurement Fair www.sensor-test.com	30th May to 1st June 2006 hall 4, stand 143 Nuremberg	Sensitec GmbH
 SMT/HYBRID/PACKAGING International Fair for system integration in micro electronics www.mesago.de	30th May to 1st June 2006 Nuremberg	Lust Hybrid-Technik GmbH
 focus. The technology forum of Switzerland www.focus-forum.ch	20th to 22nd June 2006 Zurich	Lust-Tec GmbH, Switzerland
 BIAS 2006 International Fair of automation and instrumentation www.bias.it	20th to 23rd September 2006 Milan	Lust Servosistemi srl, Italy
 Motek International Trade Fair for Assembly and Handling Technology www.motek-messe.de	26th to 29th September 2006 hall 7, stand 313 Sinsheim	Lust Antriebstechnik GmbH
 SPS/IPC/DRIVES International exhibition and conference for electric automation www.mesago.de	28th to 30th November 2006 hall 4, stand 246 Nuremberg	Lust Antriebstechnik GmbH Lust DriveTronics GmbH Levitec GmbH

Learning at LUST

[Four members of staff from the Repair/Service, Production and Testing Technology departments have once again demonstrated that training is an integral part of the LUST corporate philosophy.]

Markus Schuster, Marco Schütz, Karl-Heinz Schuster and Matthias Tempert underwent a three-month part-time course in opto-electronics at the Technical Academy of the Werner von Siemens School, culminating in their qualification as state-attested technicians. Two of them passed the final exam with an outstanding 1.5 mark.

In order to ensure practical relevance and maintain a direct link to the production process, the project tasks completed by the students encompassed the development of products which were immediately integrated into LUST's manufacturing processes. These included an automatic test system for c-line DRIVES assemblies.

We would like to take this opportunity to congratulate our young technical specialists on their achievement, and wish them every success in meeting the future challenges of their careers.

Anni Tonigold
Lust Antriebstechnik GmbH

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[From left.: Marco Schütz, Karl-Heinz Schuster, Markus Schuster, Matthias Tempert]

On the spot!

Linear drive engineering is conquering the world of printing technology!

[For centuries, typefaces of all kinds were set – letter for letter and character for character – in painstaking manual work by traditional typesetters. This was enormously time-consuming, and could only be done by specially trained and suitably skilled people; very good spelling and a steady hand, allied to a talent for layout, were an absolute must. These demands meant that it would often take several days to type-set a single page of a book.]

In recent decades, however, the computer has become more and more prominent in the printing industry. The ancient trade of the typesetter has become the modern-day web or media designer. Computerization and the resultant database capability has also led to completely new methods of producing the actual typefaces, incorporating the possibility of fully automated production of what had

originally been hand-made letter cases. Consequently, the letter case was replaced by the printing plate as the template for the printing process. Until just a few years ago, printing machine manufacturers relied on film exposure of the plates. But the age of digital photography saw the emergence of so-called

CTP – Computer to Plate – technology.

In the CTP process, the printing plate is exposed directly in the exposure unit by burning into the structure using a laser beam.

„The advance of the laser head demands extreme precision in terms of the rate of feed of the drive. Even minor fluctuations would render the printing plate unusable.“

This method eliminates the need for film exposure completely, saving time and material cost. Moreover, directly exposed printing plates deliver very high-quality print results, as the marginal sharpness of the raster points is higher and smaller raster points can be produced. This does, however, also demand high levels of performance on the part of the drive

[Automatic printing plate feed on CTP machines]

systems. Any control inaccuracy affecting the true running or the feed of the plate or the laser head would cause raster errors which would be visible in the printed image. To date, applications in this field have relied on servo technology, with high-resolution encoders and specially balanced motors, as this solution provides good performance in terms of true running. For the advance, low-play spindles were used, though they did result in problems of torsion, especially on machines with wide exposure ranges. In order to safeguard constant quality, regular servicing intervals were essential for such machines. The ever-growing demands on printers – requiring production safety allied to top quality while maintaining very fast printing plate production, with almost zero maintenance and absolute robustness – make this area of application very interesting for linear drive manufacturers. Based on its rigid, direct coupling of the load, its low space take-up and the elimination of problematic spindles, as well as the security of constant drive costs, this system will be the way forward in future.

„A linear movement can be executed with a highly dynamic linear motor with no mechanical conversion.“

The solution deployed here is the CDD3000, with an iron-core linear drive and an optical measuring system. The tried and proven CDD3000 servocontroller thus delivers astounding performance in terms of positioning dynamics and feed consistency with direct drives. Raster errors caused by inaccurate feed are reduced to an absolute minimum. Rapid return motion to unload the plate and start the new exposure improves the cycle time of the machine many times over. All previous wearing components are entirely eliminated. As the CDD3000 drives virtually any motor, and has already been in use in other applications, no induction into operation of the drive system is needed. The link to the higher-level control system is still implemented without problem by way of a field bus system.



„In order to exploit the full performance of a linear motor, the feedback system and the servocontroller must also meet high demands.“

Specialist control engineering operations such as measured value processing (GPOC – Gain Phase Offset Correction), detent torque compensation and various pre-control mechanisms were developed in order to meet the high demands placed on direct drive systems. These developments provide very high positioning dynamics and very good uniformity of rotation speed or velocity. With regard to the issue of commutation finding* with no absolute value

sensor, LUST provides a variety of solutions which can also be deployed in conjunction with braked motors. Depending on the measuring system, dynamic positioning tasks with an accuracy of 1 µm are possible.

** LUST has produced a publication on the 'commutation finding' function required for this, which in recognition of its innovative character received the 2004 VDE/ETG Award (proceedings SPS/IPC/DRIVES available at Franzis Verlag, ISBN 3-7723-6709-7).*

*Bernd Kaiser
Lust Antriebstechnik GmbH*

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Service

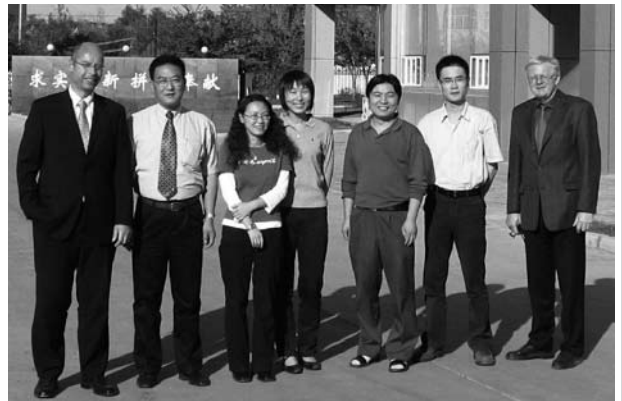
Lust Antriebstechnik has developed specialist control engineering operations such as measured value processing (GPOC – Gain Phase Offset Correction), detent torque compensation and torque pre-control in order to meet the high demands placed on direct drive systems. These developments provide very high positioning dynamics and very good uniformity of speed (feed). With the CDD3000 servocontroller series, the company is demonstrating its capability as an expert partner in the field of direct drive technology. The system is rounded off by the DRIVEMANAGER PC-based software tool, providing intuitive operation of all c-line DRIVES devices.

Wind energy growing in China

[We have once again demonstrated the substance behind the old truisms: ‚fortune favours the brave‘. We have been heavily involved in the development of wind energy in China from the very beginning, and have succeeded in gaining a competitive edge based on our high levels of expertise and professionalism. „At the turn of the year we recorded our first major successes in terms of orders in this area of business“, reports Dr. Yongfan Wang, Chief Executive of LUST China]

It was in the second half of 2004 that the Chinese government initiated developments, by introducing its Law on Renewable Energies into its parliament. As a result, 2005 saw rapid growth in the wind energy market in China. The Chinese government now plans to increase the capacity of the country’s wind turbines from the current output level of 1,000 MW to 4,000 MW by 2010, and to 30,000 MW by 2020. „Issues of energy strategy and energy safety are primary concerns of the government“, says Song Hoaping, LUST Key Account Manager for wind turbines.

Motivated by those ambitious government plans, international manufacturers of wind turbines are investing heavily in China. In parallel, domestic manufacturers, many of them newcomers, are entering into cooperation agreements on this market with the global players, and thereby introducing state-of-the-art technology into the country. The Chinese government is supporting both investments by global players and the involvement of domestic manufacturers. „Energy supply from wind power in China is scheduled to increase by up to 70 % a year“, reports Song.



[From left.: M. Vehring, Dr. Y. Wang, with business partners and H. Dicke]

Dr. Wang assesses the current situation as follows: „For us this is nothing new. Opportunities are always challenges too. LUST is currently implementing its strategy aimed at attaining

market and technology leadership in the automation of wind turbines in China. We are on the right track.“

*Song Hoaping
LUST Servo Systems, China*

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TOP votes LUST Newcomer of the Year



[The knowledge transfer program TOP (Transfer of knowledge, Optimization of processes, Practical learning), initiated by the German Federal Ministry of Trade and Technology, is highly regarded among technical specialists and business managers.]

For over a year now, LUST has been making its expertise available to outside visitors by hosting a series of workshops as part of the TOP program (see also LUSTtec numbers 15 and 16).

When we were asked whether we wanted to participate in the TOP program, we gave it lots of thought. Are we good enough to be part of it? Are we innovative enough for other companies to learn from us? After a year, we can safely say that the answer to all such questions is „yes“.

Our topic, „Kanban and more“, proved to be a much appreciated success, as was seen clearly on the two workshop days we hosted. Many companies practice the Kanban method of logistics, but not

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Energy saving with inverters from LUST

[Europe's most state-of-the-art and efficient MR chip manufacturing facility relies in its clean-room production on tried and proven technology from Lust Antriebstechnik GmbH.]

Sensitec Naomi GmbH, based in Mainz, has optimized its range of clean-room systems with CDA3000 drive systems from the LUST c-line DRIVES series, and as a result has achieved substantial energy savings.

The original method of operating the clean-room ventilation fan motor by transformers entailed the disadvantage that a substantial portion – around 30 % – of the supplied energy was converted unused into heat.

Installing state-of-the-art LUST frequency inverters has reduced day-time power consumption from 4.4 kW to 2.6 kW, while retaining the air flow rate of 1.25 m/s essential for a clean-room.

The lowered night-time operating mode (partial shut-off/reduced speed) was improved from 0.8 kW to 0.06 kW (shut-off). The digital inputs featured as standard in the frequency inverters meant that they could be connected to the existing

building automation system (EIB bus) without modification. Over this bus the modules are simultaneously set to day-time or night-time (reduced air flow) mode.

The cost of replacing the transformers with state-of-the-art inverter technology will have been amortized in just nine months.

And the new system offers even more benefits:

- The individual motors can be operated separately and much more precisely, thereby improving the quality of the clean-room significantly.
- The motor data is collated and evaluated centrally (so any problems are immediately detected).
- The service life of the fan motors is prolonged, as changes in speed can be effected much more gently.

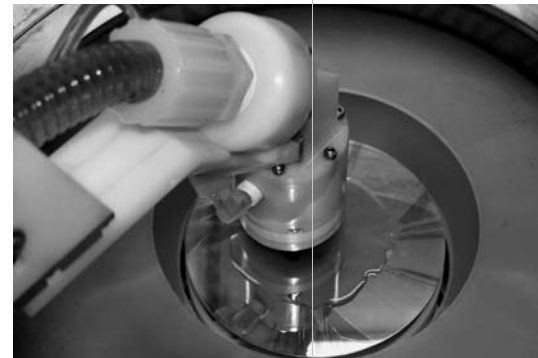
In an initial project phase, 50 CDA 34.010 type frequency inverters have been installed.

In a second phase, in 2006, a further 100 will be added. In the meantime general energy costs have risen further, again underscoring that this refit was the right decision to make.

In total, with a substantial 150 units in place, an electricity saving of 2,000 MWh per year is being made.

Based on the current electricity mix in Germany (around 300 kg of CO₂ emissions per MWh of electricity), this means a saving of some 600 tonnes of CO₂ per year – representing a major contribution to the protection of the environment.

*Ralph Müller, Klaus Hahn
Sensitec Naomi GmbH*



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with the enhancements and variants we deploy, such as Kanban with integrated claims management, or by webcam.

The factors leading to our being voted Newcomer of the Year 2005 are the ultimate affirmation of the work we did. The first criterion in determining the award-winner was the response in terms of bookings for the events. Each of our workshops was overbooked, so that we even had to set up a waiting list.

The second key criterion was the appraisal of the event by the participants at the end of the day. In this, too, LUST achieved above-average ratings.

We are proud to have received this award, because it boosts our commitment not only to being one of the most innovative companies in terms of our product technology, but also to being among the best in the country with regard to our supply chain management methods and their implementation.

*Eberhard Schmauch
Lust Antriebstechnik GmbH*

A New Generation of Wafer Stocker with Integrated Sorter and Metrology



[Over the past 15 years, Tec-Sem has established itself as a leader in semiconductor equipment manufacturing as well as in semiconductor tool OEM-based automation solutions. The technology used in Tec-Sem's test wafer stocker, which is sold directly to semiconductor manufacturers, is characterized by an ultra-dense, highly cost-effective storage methodology in which wafers are stored „bare“ rather than in carriers.]

After having successfully proven the efficiency of single wafer management in production fabs, the new Pr@ctor 300 will now also be used in a 300 mm R&D environment with highest requirements.

Tec-Sem offers products to the market which integrate the sorter functionality with bare wafer storage capability. Today, different leading 300 mm fabs are using this unique technology to manage their test wafers with great success. With Pr@ctor, a new product generation was introduced to the market which offers even more flexibility and performance.

Specifically for highly complicated applications with mixed, small production lots, increased cleanliness requirements and a lot of different wafer grades, the single wafer management can show its unique performance:

- Wafer storage and sorting in one tool, even combinable with metrology reduces logistics complexity in the fab and eliminates cassette traffic
- Very dense wafer storage @ ¼ pitch results in massive floorspace-saving (up to 3-4 times) compared to a traditional stocker and sorter approach

- Individual wafer management by integrated software (wafer category, inventory) with automated category change mechanisms
- Improved wafer storage quality by long-term storage under N2 or ultra-clean air
- Unmatched wafer access speed without any FOUP traffic in the fab allows shortest possible time for lot composition
- Fully automated and host controlled lot composition without any manual intervention

Another decisive factor was the integrated „Safe Standstill“ function, as it enabled the safety design to be greatly simplified.

*Martin Brawand
Lust-Tec GmbH, Zürich*

*With the kind assistance of
Tec-Sem AG, Tägerwilen,
Switzerland
www.tec-sem.com*

These advantages result in greatly improved factory efficiency specifically for test and engineering wafers.

Drive engineering:

For dynamic and safe positioning of the lift in the stocker, Tec-Sem chose CDE3000 drive controllers with LSH servo-motors from LUST. The key factor in the decision was the system's full implementation of a CANopen interface to DS402, with the possibility of applying Interpolated Position Mode, enabling the movement profiles of the lift drive to be optimally controlled.

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Automation solution for process engineering utilizes the full c-line DRIVES basket

[Modern-day chemical process plant design concepts offer both process diagnosis and the facility to directly influence current process parameters.]

Those demands are also made by Henkel Oberflächentechnik, based in Herborn-Schönbach in the Hesse region of Germany, with regard to the drive components for its state-of-the-art surface treatment plant.

A plant visualization system allied to Emerson control enables the operating personnel to select and influence the desired recipes.

Production process actuals can be diagnosed via the Profibus DP interface to the CDA3000 frequency inverters. Specification values from the process computer then automatically ensure that large quantities of material can be fed in to a high degree of precision.

Chemical plants demand solutions which allow for long

motor cables and low voltage steepness in actuating pumps, stirrers and mixers. 100 % plant availability is a must.

The basket of c-line drive components, incorporating MD motor chokes and MRF motor filters, meets all those requirements.

The same frequency inverter types and accessories could be employed for the open-loop controlled fluid pumps, which feed material into the process vessel, and for the stirrers in the mixing process.

The short lead time from drawing board to finished plant was aided by efficient project planning, easy system assembly and deployment of the commissioning tool DRIVEMANAGER. Then in the maintenance plan other

components can be efficiently deployed with the SMARTCARD SC-XL and the KEYPAD KP200-XL.

Complete drive solutions for all operations – mixing, dispersing, dosing, filling, pumping-off, etc. – are available all from one source: LUST.

*Jörg Möglich-Hellhund
Lust Antriebstechnik GmbH*

*With the kind assistance of
Henkel Oberflächentechnik
GmbH, Herborn*

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High-precision position sensors



[Levitec has been well-known for years as a supplier of magnetically mounted systems. A central pillar of its business operations is position detection of metallic shafts with the aid of position sensors. The demands placed on the position sensors are high, as their signal quality directly affects the quality of the control and thus the positioning accuracy of the system. Consequently, the development and manufacture of high-grade, precision position sensors is among Levitec's core competencies.]

Book tips

„Lernen

Gehirnforschung und die Schule des Lebens (Learning - brain research and the School of Life)

Manfred Spitzer

The latest findings in brain research set out in everyday language. How the learning machine in our head works, and how we can deploy it to learn successfully – and have fun doing so.

Published by: Spectrum Akademischer Verlag, ISBN 3-8274-1396-6

„Einfach managen

Klarheit und Verzicht- der Weg zum Wesentlichen (Simply managing – clarity and austerity – the route to the essentials)

Dieter Brandes

The author provides lots of illuminating examples of the illogicality of complex systems, setting out the reasons for it and ways to avoid it. Published by: Verlag Piper,

ISBN 3-492-24329-0

„Abenteuer EnergieEinsparen 2“

(The adventure of energy-saving 2)

Frank Lischka

DVD/VHS Fundamental considerations of how to reduce energy costs in buildings. A must prior to any investment decision. Published by: FUCHS MEDIA, www.fuchsmedia.de

CANopen

Holger Zeltwanger (publ.)

The book sets out the basics of communications engineering and details the communications services provided. Published by:

VDE Verlag, ISBN 3-8007-2448-0

There is increasing market demand for systems providing distance and position detection of metallic objects. It was for this reason that Levitec developed the new PS5000 series – a sensor system featuring up to five channels. Sensors compatible with the electronics are available for integration into customers' applications. Existing sensors can be adapted or new ones developed, according to customer requirements.

Key features of the sensor system are: supply voltage 24 VDC; measurement of metallic objects; resolution ≤ 100 nm over a distance of 500 μ m; absolute accuracy ≤ 2 μ m; analog output signal 0 V to 10 V.

One of the current applications is position detection in machine tools based on thermal influences. The detected position is delivered to the control system by the Levitec sensor system and is adopted as a correction value in positioning of the axes of the machine tool. The customer benefits lie in much greater precision of the machine tool and in reduced machining times.

Another field of application is in mechanically mounted motorized spindles used in diagnosis and monitoring. The position sensors can be used, for example, to provide information on the balance of the

rotor and the wear condition of the ball bearings. Impermissible operating states can also be detected. This enables planning of maintenance and prompt replacement of the spindles and bearings as necessary.

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