

# LTi | INNOVATION

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## Machine Tool

Leading-edge technology for machine tool outfitting

### Machine Tool

LTi offers complete solutions for machine tool outfitting and calls upon the know-how of individual Group members

### PVmaster

LTi REEnergy continues expanding into markets promising growth for the future

### New products

Presentation of the new compact series CDi3000 and Safety Control SMC2 at SPS/IPC/DRIVES

## 40 Years of LTi

### Younger, more innovative and more experienced than ever

When you arrive at LTi, you immediately feel the spirit of a young, innovative yet experienced company.

Strong continuous growth has enabled us to keep on recruiting new young employees – almost 100 this year alone. The age structure at LTi shows an exemplary split among all age groups.

LTi's compartmentalised structures facilitate fast and flexible decision making for customers. At the same time, the size of the group provides all business partners with security and symbolises sustainability and tradition.

The company's founder Karl-Heinz Lust launched the business in 1971 with new solutions in electrical engineering and, up to his death in 2009, shaped the company with his visionary approach and focus on technological trends. The opportunities resulting from the broad-based basic development he promoted are almost unlimited. The company still places huge emphasis on research and development, investing 9% of its turnover in this area.

When it comes to its markets, LTi also has a strategy that is clearly focused on future markets and those that need and are open to innovations. From year to year, LTi is increasingly developing into an innovation leader in the strategic areas it occupies. Customers' recognition of and trust in LTi as a dependable partner is revealed by the numerous awards presented by customers and, above all, in the long-term nature of the relationships.

We are still in the early days of LTi's history. Because of our broad range of technologies and products, there are no limits on our development. Every day, we once again dedicate all our efforts to finding the best technical and economic solution for our customers and support them in expanding their market-leading position.



Dr. Wolfgang Lust

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5 in 1



## 5 in 1 with MotionOne

It's all down to the quality of the ingredients! LTi uses only the best components to create a tempting automation concept to ensure your success:

□ To start with, take the (1) automation of complex movements □ supplement with a dash of (2) precise and dynamic drive technology □ and several parts (3) of scalable HMI panel solutions, □ then add (4) programming to market standards □ before finishing off the cocktail with a good shot of safety (5).

# news



## LTi investing in new plant

As in the past two years, in 2011 LTi is once again investing heavily in new production plant, machinery and buildings. It is committing more than EUR 7.5 million to its home plant in Germany alone in order to further expand production capacity and optimise processes. „The primary aim underlying our investment programme is to boost the competitiveness of our business and so safeguard jobs for the long term,“ explains Managing Director Dr. Wolfgang Lust. Another high priority is research and development, in which the company will be investing over EUR 10 million in 2011. The investments will be targeted at advancing technological know-how as well as paving the way for the development of new business fields and ground-breaking product innovations.



## Machine Tool Technology Conference in Darmstadt

On October 13, 2011 industrial experts and scientists gathered at the Institute of Production Management, Technology and Machine Tools (PTW) to discuss trends, new technologies and potential applications for the electronic control of machine tools. Professor Dr. Eberhard Abele from the PTW, scientific staff of the Institute and speakers from LEVITEC, andron, LTi DRIVES and Sensitec presented papers on topics including the service life demands placed on tool spindles; the state of the art in magnetic bearing mounted high-speed spindles; the possibilities offered by state-of-the-art CNC controls for highly dynamic machine tools; functional machine safety; and new sensor solutions for delivering even faster results. All those attending praised the highly informative nature of the event.



## PVmaster II presented in Taiwan

Over 10,000 visitors from all over the world gathered in October at the Taipei World Trade Center for the Photovoltaic Forum & Exhibition Taiwan (PV Taiwan).

Covering an area of almost 17,000 square metres, the event provided the 300 exhibitors with a key opportunity to target trade customers.

LTi REEnergy Taiwan presented its new generation of central inverter, the PVmaster II series, in the power range from 33 to 500 kW.

The PVmaster II is suitable for use worldwide thanks to its wide-ranging approvals and conformity to national laws and standards. It also features multilingual user interfaces and menu guidance.





# A maestro as a soloist – unbeatable as an ensemble

Complete solutions from LTi for machine tool outfitting

**M**achine tool manufacturers are being confronted by the demand to improve the productivity of their products while at the same time gaining an edge over the competition. Rising productivity is also increasing the complexity of the machine tools. And machinery also has to meet functional safety and energy efficiency requirements too.

LTi is able to offer complete solutions for machine tool outfitting. Integrating coordinated components reduces cost and complexity for machine tool manufacturers. In providing these solutions, LTi is able to call upon the know-how of the individual Group companies, all of whom are technology leaders in their fields.

#### **Fast, flexible CNC from andron**

The andron GmbH company has been part of the LTi Group since 2009. Its andronic 3060 CNC controller supports numerous interpolation modes up to interpolating 16 axes. The controller can handle complex coordinate transformations as well as Cartesian calculation of paral-

lel kinematics. It can compensate for a variety of axis and geometry errors. The andronic 3060 can thus be applied to practically any machine kinematics.

A dynamic look-ahead buffer provides a preview of up to 25,000 blocks. It takes less than 100  $\mu$ s to process a block. The position setpoints are sent via the SERCOS interface to the servocontrollers every 125  $\mu$ s. Thanks to this, the andronic 3060 is particularly well suited to applications in which high volumes of data have to be processed rapidly, such as milling of free-form surfaces.

#### **Spindles for maximum precision from Fiege**

Heinz Fiege GmbH & Co. KG has likewise been a member of the LTi Group since 2009. Fiege supplies motor spindles for a variety of manufacturing technologies. It specialises in providing custom solutions tailored to specific needs. The use of special materials guarantees high dimensional stability even under extreme operating conditions. Only high-precision pre-tensioned ball bearing are used. The resultant bearing rigidity allows for high material stripping rates when operating the spindle. The

custom-developed labyrinth, with supporting air purge, lastingly protects the high-grade spindle system against dust and cooling lubricant. This prolongs the life of the spindles.

#### Highly dynamic drives from LTI DRIVES

ServoOne servocontrollers from LTI DRIVES meet the highest demands in terms of dynamics and synchronism thanks to their integrated special control algorithms and their minimised dead times. The ServoOne is capable of evaluating a broad range of different encoders. The patented GPOC (Gain Phase Offset Correction) encoder correction method eliminates offset, gain, phase and eccentricity errors on analog encoder signals. Thanks to this, the ServoOne is suitable for applications which demand especially high machining quality. An extensive range of servomotors rounds off the LTI DRIVES portfolio of products for machine tools.

#### State-of-the-art safety functionality with Safe Motion from LTI

The LTI SafeMotion architecture enables solutions to be configured

in order to guarantee the functional safety of machine tools. The safety solution can optionally be either controller-based or drive-based. A broad range of safety functions are available. This flexibility allows the right solution to be configured for any application case.

#### Magnetic bearing mounted high-speed spindles from LEViTEC

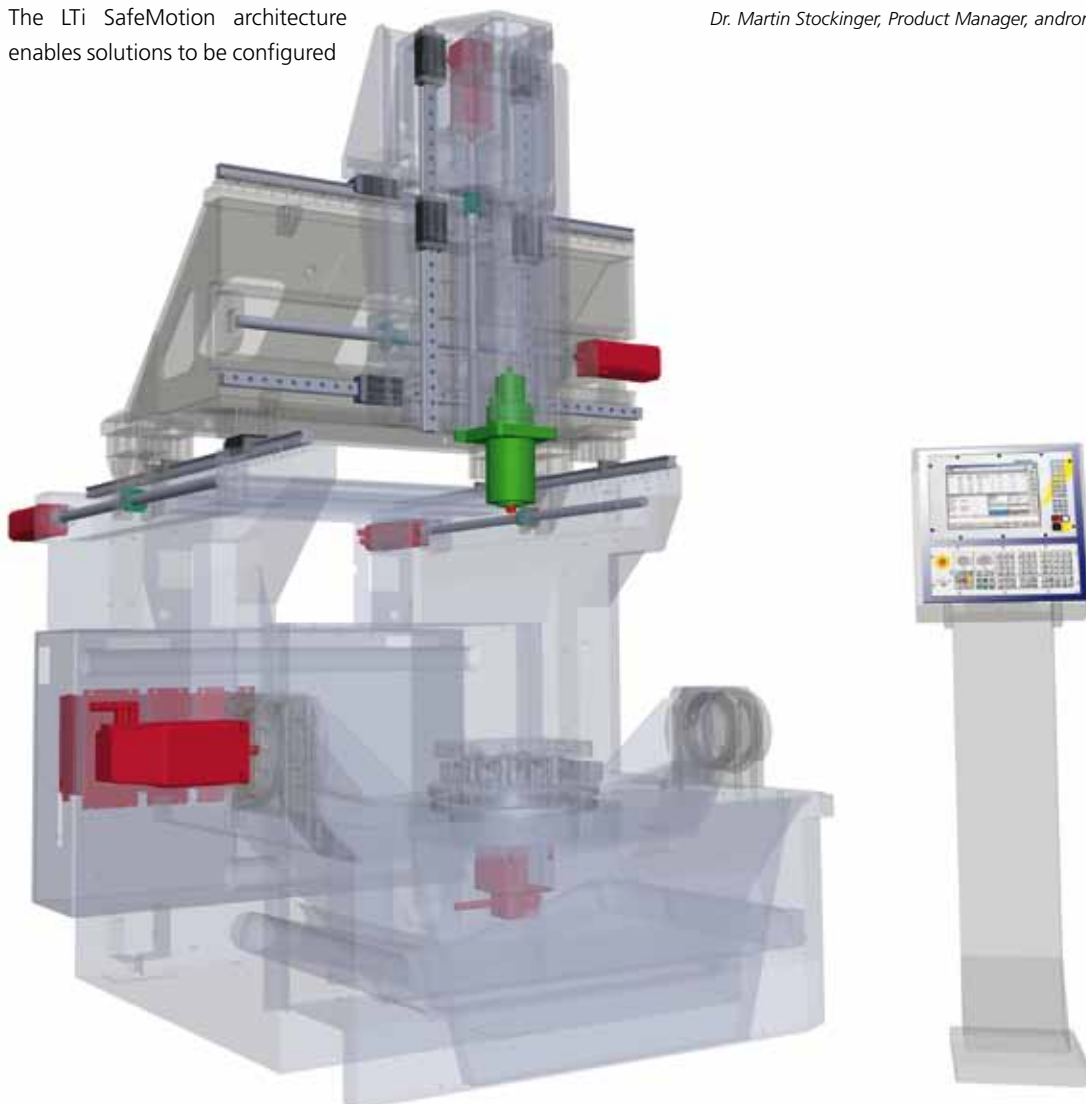
High-speed spindles from LEViTEC are mounted on magnetic bearings. Magnetic bearing technology extends bearing life and the true running achieved results in better workpiece surface quality. The low power loss means there is less heat on the shaft and so accuracy is improved.

#### Precision sensors from Sensitec

Sensors from Sensitec are used wherever speed, angle and position need to be measured by non-contact means, with high dynamism and precision, in robust environments.



Dr. Martin Stockinger, Product Manager, andron ■





Source: Gardena

## Computerised CNC from andron ensures sharp blades

**CHEAP GARDEN TOOLS** from discount stores often break just when you are preparing for a barbecue or wanting to trim the hedge before a storm closes in. Quality defects of such a kind are reliably prevented by garden products manufacturer Gardena based in Ulm.

The European market leader has been using grinding machines featuring computerised andronic control systems for the last 10 years. „The advantages of this are ease of control based on an intuitive menu-driven user interface, as well as the ability it provides to update the grin-

dena also to produce blades which demand a high degree of accuracy during grinding. „We could not make our anvil blades for branch-loppers and hand-held trimmers without the fast CNC-controlled Berger machines,“ asserts Production Manager Hans-Jürgen Jahn.

*Dr. Martin Stockinger, Product Manager, andron* ■

The CNC programmes controlling the grinding machines must keep precisely the grinding paths, so that every blade is identical

ding machine quickly and easily to the latest state of the art in computer technology,” comments Karl-Heinz Rochlitzer, Managing Director of CNC controls manufacturer andron, based on Wasserburg on the shores of Lake Constance. What results is a highly precise and fast CNC program which, in conjunction with grinding machines from Wuppertal-based Heinz Berger Maschinenfabrik GmbH & Co KG, enables Gardena to produce several million sharp blades a year.

The Ulm plant makes blades for a wide variety of garden equipment, such as anvil blades, hedge-trimmers and lawnmowers, at a rate of one every 45 seconds or less. As Gardena Production Manager Hans-Jürgen Jahn explains: „Our blades have to be perfectly ground. They must not be bent at all, and no grinding burn must be allowed to occur.“ Grinding burn occurs when the material heats up during grinding. As a result, it turns blue and becomes brittle, so rendering the blade unusable.

To prevent this, the CNC programs controlling the grinding machines must keep precisely to the grinding paths, so that every blade is identical. The program must also be capable of processing other blade geometry data without error. The end-product must be a blade which has a certain roughness in order to cut. The precision of the control system and the grinding machines enables Gar-



▲ Three grinding stations, each running two CNC-controlled grinding machines, have been delivering precision grinding performance at Gardena for the last eight years. Since the control system runs on standard commercially available CPUs, the machines can be retrofitted and updated in line with any new technical developments.

Source: andron GmbH

## Tyres as design objects



is vital especially in complex 3D engraving of various depth layers. In 3D machining, all four machine axes guiding the spindle must start precisely and simultaneously at one point. Only in this way can defect-free milling of the mould surface be guaranteed. To achieve this, the CNC control must provide a constant path computation referred to the tool tip so that the travel speed at the tip always remains the same – regardless of the curvature of the mould.

*Dr. Martin Stockinger, Product Manager, andron* ■

THE SIDEWALL of a tyre contains a large array of letters and numerical codes, indicating its size and type, permissible speeds and load-bearing capacity, licence number and coding in line with a variety of different regulations. To ensure that this mandatory information is easy to read on the tread, the characters must be precisely contoured in the steel moulds into which the complex rubber compound is pressed during the vulcanisation process.

The trend in car tyres is towards unusual texturing, such as leather-textured lettering. „Demand for tyre sidewall moulds is high because a separate mould has to be milled for each individual tyre model in order to produce the sidewall,“ explains Andreas Steidel from LANG GmbH & Co. KG. The company, based in Hüttenberg in the German state of Hesse, develops and manufactures machinery to make sidewall moulds in virtually any size.

The rising demands of customers and the increasingly complex and costly designs have led to a steady expansion in the volumes of data which the milling machines have to handle. As a consequence, the mould-making process gradually took longer. In response to the trend, back in the year 2000 LANG began using CNC controls from andron GmbH, based on Wasserburg on the shores of Lake Constance. „The andronic control, which we deploy in the maximum configuration for the LGT-S, enables us to compute even very large data volumes rapidly and implement them in the milling and engraving process,“ Steidel reports.

Fast calculation of the feed rate by the andronic control



↑ The swivel axis ensures that the spindle with the milling tool is always at an angle of 90 degrees to the alternately convex and concave surface, in order to deliver the maximum possible accuracy.

Source: LANG GmbH & Co. KG

## Precision prefabrication with spindle technology from Fiege



For WIGO-HAUS in Feldkirchen, Austria, which makes solid-wood prefabricated houses, Fiege Spindeltechnik developed a milling spindle tailored to meet the high demands of wood-working.

The task involved making cutouts in the solid-wood house's walls for windows and doors, as well as recesses for electrical switches and power sockets, using a portal milling machine.

To do this, the prepared house wall is first positioned on the portal milling machine, which has a working width of approximately 4 metres and is approximately 10 metres long. Then the Fiege milling spindle – fitted out with a special wood-working tool – cuts out each position under path control.



Source: WIGO

A particular challenge in wood-working is the need to protect the bearings and all the internal components against contamination by dust and dirt.

The specially developed labyrinth and barrier-air seal performs just such a function.

The Fiege spindle is 290 mm in diameter, has a total length of 600 mm and produces a driving power of 45 kW, running at 9500 rpm. It features a balanced quadruple bearing system with medium pre-tension, so as to

provide adequate stability for the machining process. Thanks to this special design, the service life of the spindle – normally just a few months when machining wood – has been extended to two years.

*Mathias Fiege, Managing Director, Fiege* ■



## High-speed now also for ServoOne

**THE UPGRADE TO the ServoOne family with the HF function package has added high-speed servocontrollers to the range, rounding off the LTI DRIVES portfolio and reaffirming it as a provider of complete solutions for automation, and especially for spindle applications in machine tools.**

The key feature of the ServoOne HF is its maximum rotating field frequency of 1600 Hz allied to switchable clock frequencies up to 16 kHz. This is accompanied by an optimized fast current controller running at double the clock speeds, which significantly improves the sometimes rather difficult control of low-inductive high-speed-motors. Any necessary output reactors or sinusoidal filters are built-in to the control. Synchronisation to the running motor and a power failure backup mode make the ServoOne HF also ideal for applications featuring high-speed compressors, turbocompressors or magnetic bearing supported units.

The full power range from BG1 to BG7 is available, as a result of which the ServoOne HF upgrades the series from 4-270 A for speed up to above 90,000 rpm.

As well as standard rotary encoders, the ServoOne HF can also be used to evaluate open-collector Hall switches, as are in widespread use in the high-speed sector. For suitable synchronous motors the ServoOne HF additionally offers the facility of fully sensorless closed-loop control.

For open-loop mode the ServoOne HF offers special inverter features with extensive VFC functionality such as IxR and slip compensation, anti-oscillation, current limit



↑ Milling spindle driven by ServoOne HF

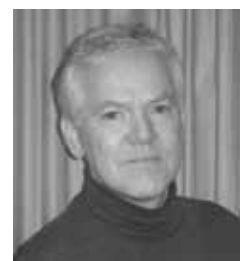
**The key feature of the ServoOne HF is its maximum rotating field frequency of 1600 Hz allied to switchable clock frequencies up to 16 kHz**

control, up to six characteristic interpolation points and characteristic switchover even for ultra-high speeds. Twin-motor operation (either two motors in the drive train or two independent motor windings in one stator) can be safely controlled by using two controllers and the optional TwinSync technology. Alongside the TwinSync option, the HF version supports all communication and technology options of the ServoOne family.

In the next development phase, ultra-high speed controllers in the power range 11-50 kVA with rotating field frequencies up to 4000 Hz and clock frequencies up to

64 kHz will be integrated into the ServoOne series. This will make it possible to operate at speeds well above 200,000 rpm or to run more energy-efficient high-speed motors with more pole pairs. The high clock rate in most cases eliminates the need for output filters or reactors.

*Eberhard Lepper, Product Manager, LTI DRIVES* ■



## China's largest solar project is feeding power into the grid thanks to PVmaster



**IN MAY 2011** the first 10MW of China's largest solar power project – a plant in Chinese Mongolia planned to deliver 40 MW – was connected to the grid. The energy recuperation on the project is being handled by 10 PVmaster stations from LTI Reenergy Systems (LRS).

The photovoltaic project, initiated by CE-CEP Solar Energy Technology Co., Ltd., is located in Alxa, in the Chinese region of Inner Mongolia, and represents a total investment of 220 million Euro. A total capacity of 40 MW is being installed at a facility covering an area of 400,000 m<sup>2</sup>. In July 2010 LTI Reenergy Systems was awarded the contract to supply 10 MW PV inverters. The contract was officially signed in early August 2010. The plant has since begun successfully feeding the first 10 MW of capacity into the grid. Following installation of the total capacity, the plant will deliver CO<sub>2</sub> savings of 15,000 tonnes a year compared to fossil fuel use.

**This first LRS megawatt project on the Chinese mainland represents a milestone in the development of the Chinese market for LTI as a whole**

The plant is currently operating two different PV modules. It is running 5 MW modules from ENN (thin-film modules) and Jintech Solar (polycrystalline modules). In order to meet the project requirements and optimise the efficiency of power generation, two PVmaster technologies from LRS tailored to the special needs of the different PV modules have been deployed. They are implemented in 10 MW sub-



stations each containing 20 PVmaster PVM 450-250-EM or PVM 450-250 OT master stations respectively. These PV master stations include parallel-configured water-cooled 250 kW inverter units operating in master/slave mode as well as multi-winding transformers. Optimum utilisation of the PVmaster units thus delivers a highly cost-effective solution.

This first LRS megawatt project on the Chinese mainland is not only of major importance for LRS, it also represents a milestone in the development of the Chinese market for LTI as a whole.

*Joe Zhou, Marketing, LTI REEnergy China* ■

## PVmaster now also in Saudi Arabia

**AFTER SUCCESSFULLY LAUNCHING** the PVmaster large-scale inverter in Europe, China and Taiwan, LTI REEnergy is expanding into markets which promise growth for the future in North and South America, Thailand, India, Saudi Arabia and Africa.

LTI REEnergy commissioned into operation a first photovoltaic plant in the Saudi Arabian capital Riyadh in Summer 2011. The powerful PV modules from Sunpower were installed over a total area of 2,544 m<sup>2</sup> on the roofs of a private building. The 496 kWp PV plant is complemented by five PVM 100 TT PVmaster large-scale inverters, each with a rated AC power output of 100 kW. The strings made of 1560 modules are combined in 14 LTI string boxes and connected to the PVmaster units.

„Anyone looking to succeed on the PV market in future will have to think and act globally. That is why – after successfully establishing the PVmaster in Europe, China and Taiwan – we are continuing our expansion into markets which promise growth for the future in North and South America, Thailand, India, Saudi Arabia and Africa. Our establishment of an international network of partners is part of that strategy.“

A. W. Reitz, Authorised Management Executive, LTI REEnergy

A particular challenge for PV plants in countries such as Saudi Arabia is the extreme heat. The PV plant in Riyadh features air-cooled inverters. An advanced control process enables even high temperature ranges to be reached, with a maximum efficiency of over 97%.

In its successful bid to take part in the project, LTI scored strongly thanks to its high efficiency and quality and based on the flexibility of its software parameter setting. The PVmaster's high-precision control of the amount of power fed into the grid was also a key factor.

In some countries, such as Saudi Arabia, private organisations are not allowed to feed power into the public grid. In those countries, PV plants are installed to cover users' own demand. PVmaster inverters feature a precise power management system which continuously adjusts the output of the PV plant to consumption levels. This safeguards compliance with local regulations while enabling lucrative solar power to be fully utilised.

If regulations change, the power management can be easily adapted. Surplus power can then be fed into the public grid as soon as the local power supply utility gives its assent.

*Adnan Elkaissi, Somiral Energy Sarl, Middle East and Switzerland* ■

[www.somiral.com](http://www.somiral.com)

# MotionOne – sets machine automation in motion



**THE MOTIONONE MODULAR AUTOMATION** package offers a wide range of solutions for machine automation. Whether you are looking for scaleable HMI panel solutions, want to automate complex movements, need precise, dynamic drive systems, or want to implement your complete setup in line with the latest safety standards (EN 13849) – LTI's MotionOne automation system offers a solution.

## Stationary HMI panels

Touch-screen displays from 8.4" to 15", a DVI port for remote control over long distances and 16 digital inputs on the panel provide high-end visualisation.

## Mobile HMI panels

Mobile HMIs with touch-screen displays in sizes from 3.4" to 6.5" extend the panel range. Integrated permission and emergency stop buttons deliver great practical benefit. A 1.5 metre drop height ensures high levels of availability.

## ControlOne CPU modules

The ControlOne control platform, offering computing power from 400MHz Power PC to 1.1GHz Atom, features maintenance-free fanless running and extensive connectivity. Available interfaces are Ethernet, EtherCAT, CANopen, PROFIBUS, RS232, USB and DVI. Program memory and data storage is provided on an easi-

ly exchanged CF card. To expand the system, I/O modules can be plugged directly into the CPU or operated remotely via bus couplers.

## COconnect expansion modules

The functionality of COconnect expansion modules includes digital input/output modules to IEC 61131-2 with 8 or 16 terminals. Analog modules to evaluate differential and unipolar signals with a 14-bit resolution are complemented by special temperature evaluation units for type J,K,L and PT100 thermocouples. The program is rounded off by a position sensor module with latch function for TTL encoders. All connections are executed as plug-in terminals..

## Servo drives from 2 to 450 A

LTI's tried and proven drive and safety engineering is likewise conveniently integrated. Interface problems are a thing of the past; connections are made via EtherCAT or CANopen. The device descriptions for ServoOne, ServoOne junior, c-line-Drives and SMC safety controllers are stored on the system. No specialist knowledge is needed to control the drives' movement. Motion functions are provided in the form of PLCopen-compatible function blocks.

## User Tools

The MotionCenter toolframe, based on the market standard CoDeSys, combines a development environment for configuration and parameterisation of the controller with an editor to write Java-based visualisation applications. An extensive library of widgets for creating attractive visualisation schemes and centralised configuration of symbol files are also provided as user aids.

Andreas Kling, Product Manager, LTI DRIVES ■



## CDi3000 – Linking motor and controller

**INTERCONNECTING** the servomotor and controller, the new CDi3000 series delivers a compact, highly dynamic servo axis. The servomotor and the controller are hermetically sealed inside a unit, and can be used for a wide variety of distributed applications in the textile industry, robotics, packaging machinery, and handling and assembly systems. The product will be launched at the next Hannover Messe trade fair in second quarter 2012.

The range will initially feature two models, with 1.5 and 2.5 Nm, fed by 230 V mains voltage and attaining power outputs of 0.45 kW and 0.75 kW respectively. The standard package will include an integrated mains filter, a built-in brake chopper with a ballast resistor and – as a variant – a 3x230 V mains input. Using robust power connectors from the solar sector and standard M12 signal plugs, contacts will be implemented which will work safely and reliably even with IP54 protection.

With the latest high-resolution HIPERFACE single- or multi-turn encoders as integrated speed and position encoders, up to 16-bit resolution (corresponding to approximately  $\pm 80$  angle seconds) will be attained. For less demanding tasks, the in-house magnetoresistive encoder system attains resolver quality with a resolution of up to 12 bits. As an option, the CDi3000 servo system can be fitted with an integral holding brake.

Alongside the standard interface with one analog input, four digital inputs and two outputs, there is also an RS-232 interface to connect to the tried and proven LTI DriveManager program for parameter setting, diagnosis and control of the CDi 3000. A standard feature is a CAN

open interface, optionally available will be current field bus interfaces and a slot for application-specific options.

The control electronics are optionally also powered externally by 24 V, meaning they can be addressed over the bus system even with no 230 V mains



↑ CDi3000

supply. In terms of software, the CDi follows the tried and proven CDE concept, though also features additional software functionality such as Cam plate, Stepwinder or Electronic gearing.

*Eberhard Lepper, Product Manager, LTI DRIVES* ■



## Even more Power with ServoOne



LTI HAS NOW more than doubled the power range of its ServoOne product family. The existing range of servocontrollers from 2 to 210 A has been extended up to 450 A. The new BG7 series is available with rated currents of 250 A, 325 A and 450 A and an over-load factor of 170%. The units' liquid cooling means they are highly compact, measuring just 380 x 900 x 300 mm.

A distinctive feature of the liquid-cooled model is that the power loss from the drive controllers is discharged directly out of the cabinet. This cuts operating costs, thanks to the lower power consumption, when the different recooling devices – the cabinet's climate control system and the water re cooler – are included in the comparison. Protection against overheating due to malfunctions in the fluid circuit is provided by a fluid separation sensor integrated into the servocontroller. It monitors the gradient of the cooler temperature and disables the power stage in the event of any sudden change.

Regenerative energy can be discharged in a shared DC network with DC link connected servocontrollers or by means of integrated braking resistors. The resistor mounting directly on the ServoOne's liquid cooler increases continuous braking power by as much as 5 kW.

In functional terms the BG7 – like the other ServoOne drive controllers – features all the latest technologies. Various Ethernet-based field buses, including EtherCAT and SERCOS III, enable trouble-free integration into the motion process. Motion profiles – to international standards of course – can be generated in a master control system or also directly in the drive. In addition, users can create special motion profiles such as an electronic cam plate or control functions with the integrated, IEC 61131 programmable sequence control iPLC.

The integrated STO (Safe Torque Off) function, certified as SIL3 according to EN 62061 or PL e to EN ISO 13849, permits fast, low-cost shutdown and restart of the power stage in safety-related applications. This eliminates the need for cost-intensive external switching elements to implement the safety functionality.



↑ ServoOne BG7

Jörg Brinkemper, Product Manager, LTI DRIVES ■

## SMC safety control end its „lonely life“

**DESPITE MANY innovations, the safety systems in machines are often based on single axes, which in most cases makes the process of validating the machinery complex.**

In its first-generation SMC1 safety controls LTI had already introduced twin-axis modules in order to optimise the interlinking of two axes. This idea has been pursued further with the development of a multi-axis safety control (SMC2). The SMC2 safety control series, which will be available from HMI 2012, will enable a central safety project to be created with reliable motion monitoring (SS1, SS2, SLS, SLI, SLP etc.) for up to 12 drive axes in a single user program.

For machinery manufacturers this means easy, efficient commissioning, minimal cabling, and much simplified validation.

The series features three different central modules with 14, 34 and 54 safe inputs respectively. For complex applications these can be expanded to incorporate axis monitoring modules as well as two additional input and output modules. With the inputs and outputs of the axis

modules, this results in a maximum configuration for complex applications of up to 98 safe inputs and 50 interfaces usable optionally as safe inputs or outputs.

In addition to the flexibility of the inputs and outputs, the key feature of the SMC2 series is the flexible sensor interfaces. This enables almost all current sensors, from TTL, HTL and SSI to SinCos and even resolvers to be evaluated.

LTI has thus ended the „lonely life“ of the SMC1 safety control. The SMC2 provides it with a powerful partner for multi-axis applications, making it fit to deliver even better machine solutions in future.



*Julian Bodem, Product Manager, LTI DRIVES*



## „One-click commissioning“ with DriveManager 5

**THE GRAPHICAL PC SOFTWARE program DriveManager 5, for commissioning and diagnosis of the ServoOne family of drive controllers, has now been upgraded to incorporate a user-friendly feature for quick serial commissioning of machines.**

The feature enables all parameters, configuration data and the firmware to be uploaded to the drive controller with a single click. The basis of serial commissioning is a file system integrated into the ServoOne which can be accessed and programmed via FTP. When a drive is commissioned into operation for the first time, a Wizard included in DriveManager generates a commissioning file.

### Automatic serial commissioning for single- and multi-axis systems

The user can choose which items of data are included in the file. The options include the parameters and configuration data, as well as the firmware.

An iPLC program programmed in IEC61131 and stored in the ServoOne can also be read from the controller and included in the file. As a result, it is no longer necessary to additionally load the PLC boot application by way of the CoDeSys programming system during serial commissioning.

DriveManager 5 is capable of managing multiple drives in a project over a TCP/IP network. This means the commissioning file can also incorporate the data of all drive controllers. So automated serial commissioning of multiple drive controllers is as easy as child's-play.

The commissioning file is transferred via the TCP/IP service-diagnostics interfaces of the ServoOne. It can also be transferred over the IP channel of an EtherCAT or SERCOS III real-time Ethernet bus system. For commissioning of single axes the USB port can also be used.

Once the network configuration is complete, programming is started by double-clicking on the commissioning file. The programming is handled by a PC tool separate from DriveManager 5. This displays the programming status at all times. When commissioning is complete, a log file is generated documenting all the steps run through. The commissioning file can also be loaded by way of DriveManager. This is useful if further diagnosis based on status displays or scope plots is going to be carried out subsequently.

*Jörg Brinkemper, Product Manager, LTI DRIVES* ■



## Record number of participants at 11th MR Symposium

THE 11TH SENSITEC Symposium on „Magnetoresistive Sensors and Magnetic Systems“ was held over a two-day period at the end of March at the Stadthalle in Wetzlar. Some 150 scientists, researchers and industry specialists from all over the world attended, taking the opportunity to exchange news, views and experiences and to hear presentations on the latest developments in MR technology.

The speakers once again included Nobel Prize winner Professor Peter Grünberg, as well as from the United States Dr. Stuart S. P. Parkin, one of the pioneering experts in the field.

The presentations covered ongoing and completed projects from the academic and industrial research spheres in Europe and the USA as well as outlining practical applications in the automotive industry, automation, robotics, aerospace, material testing and bio-analytics.

The audience showed particular interest in sensor technology based on the tunnel magnetoresistive (TMR) effect, high-speed applications, applications in lightweight robots, and in aerospace applications. One item of news revealed was that in 2013 MR components from Sensitec will be heading out on a long journey into space as part of the „BepiColombo“ mission. The „BepiColombo“ space probe is being sent out to investigate the geological composition of the sunniest of all the planets: Mercury. The mission will be carried out by the ESA in cooperation with the Japan Aerospace Exploration Agency (JAXA).

The evening event – a dinner followed by comedy entertainment from „Professor Tibatong“ – provided a convivial and relaxing accompaniment to the successful 11th Symposium.

Ellen Slatter, Marketing, Sensitec



Dr. Stuart Parkin is one of the leading experts in the field of MR technology



For two days magnetoresistive sensors and magnetic microsystems were on the agenda

## Service from LTI

Interview with Oliver Klees, Head of Application, LTI DRIVES

**SERVO DRIVE SYSTEMS** and motion solutions for machine automation are becoming ever more complex. Not just the functionality, but the bus communication too, is becoming increasingly demanding. This rapidly rising complexity can only be mastered based on a service program combining know-how, experience, products and services of the highest quality.

**What kind of service backup can LTI customers expect?**

*O. Klees:* We at LTI regard 'service' as an umbrella term covering a whole package of support which helps customers design and implement their workflows as efficiently as possible in every phase.

The customers' first contact in service terms is the joint selection of the appropriate drive system. In this, they are assisted by our project engineers in every step, from se-

**„Although varying widely in nature, the services we offer all have one thing in common: they help our customers improve their productivity“**

lection of the electric drive components through to a complete package quotation.

If customers need a complex servo system with different load cycles or even a multi-axis network, the applications engineer will calculate the drive configuration using a special program.

**What assistance does LTI provide in commissioning?**

*O. Klees:* On request from our customers, we can carry out commissioning of the drive or automation system on the machine on site. In doing so, we comply with the customer's desired timetable, usually based on a one to two week planning lead time. For very urgent cases we also offer a 24-hour express service.

**What else does the LTI service package offer?**

*O. Klees:* Today our services for customers include carrying out on-site firmware updates, plant inspections, and giving hints and tips on EMC-compatible wiring. We also program customers' sequence control, either in the controller or in our MotionOne complete automation solution.



Oliver Klees, Head of Application, LTI DRIVES

**What do I do if I need a quick solution to a technical problem?**

*O. Klees:* Our Helpline is available to deal with questions by phone or e-mail throughout normal business hours. It is always staffed by experienced applications engineers, so customers can be sure of receiving the very best expert support and advice. And we can be reached out of office hours and at weekends too – likewise free of charge.

**How personalised are the services offered by LTI?**

*O. Klees:* They are as individual as the customer's demands, because we place great value in tailored support. For example, we perform customized trainings and workshops on site. Furthermore we can help optimise a customer's goods receiving logistics.

## >> Getting the maximum from the drive!

### *Servo system drive configuration*

**WITH SERVO SYSTEM DRIVE configuration – one of many services offered by LTI – customers can be sure that no cent they spend is wasted. By incorporating all relevant parameters, each drive system is configured in such a way that the controller, the motor and the gearing are optimally utilised and the most cost-effective solution is selected.**

Due to the rapidly rising complexity of servo applications, it is becoming less and less common for a designer to calculate the required continuous torque on the motor shaft and then be able to select the motor and, by way of the required motor current, the frequency inverter and servocontroller. Instead, our customers today almost all rely on computerised drive configuration by LTI.

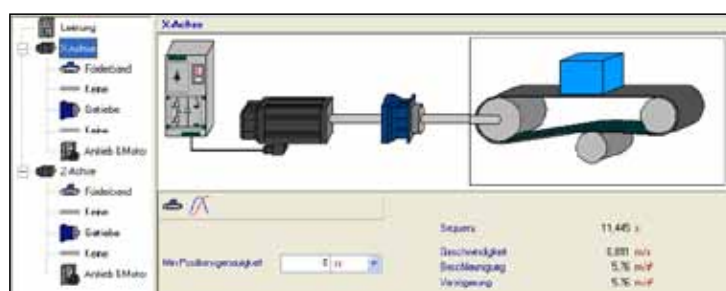
In a classic servo application, such as dynamic positioning, there are many parameters which need to be considered: the moment of inertia, the maximum acceleration, the jerk on the mechanism, the specified positioning accuracy, elasticity, etc.

All mechanical loads and required electrical power outputs are simulated in our „ServoSoft“ drive configuration program and presented in graphical form. In conventional calculations on paper, only a linear acceleration can be applied as the basis. Though this does map the fastest route of an axis, it causes considerable jerk on the mechanism, which in practice results in premature wear of the mechanism. To reduce the impact of this jerk on the mechanism, ServoSoft allows various acceleration profiles to be selected. These profiles precisely reflect the subsequent actual conditions in the plant, and so enable very accurate calculation of the required controller currents and torques.

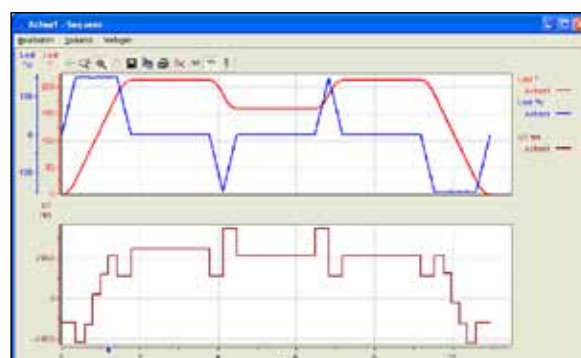
A user-friendly input facility for movements and movement segments maps the exact motion profile as specified by the customer, improving its energy efficiency where necessary and calculating from it the effective moment and the peak moments for the motor and gearing. Even highly complex multi-axis network systems with energy feedback (such as from lift drives) and the associated savings potentials are no problem for ServoSoft.

Of course, a program is only as good as its user. In order to simulate a wide range of influencing factors, such as typical friction loss or efficiency, in as realistic a way as possible, the experience and skill of the applications engineer is key. This plays a vital role in determining the quality of the configuration. That is why at LTI drive configurations are calculated only by experienced specialists.

*Oliver Klees, Head of Application, LTI DRIVES*



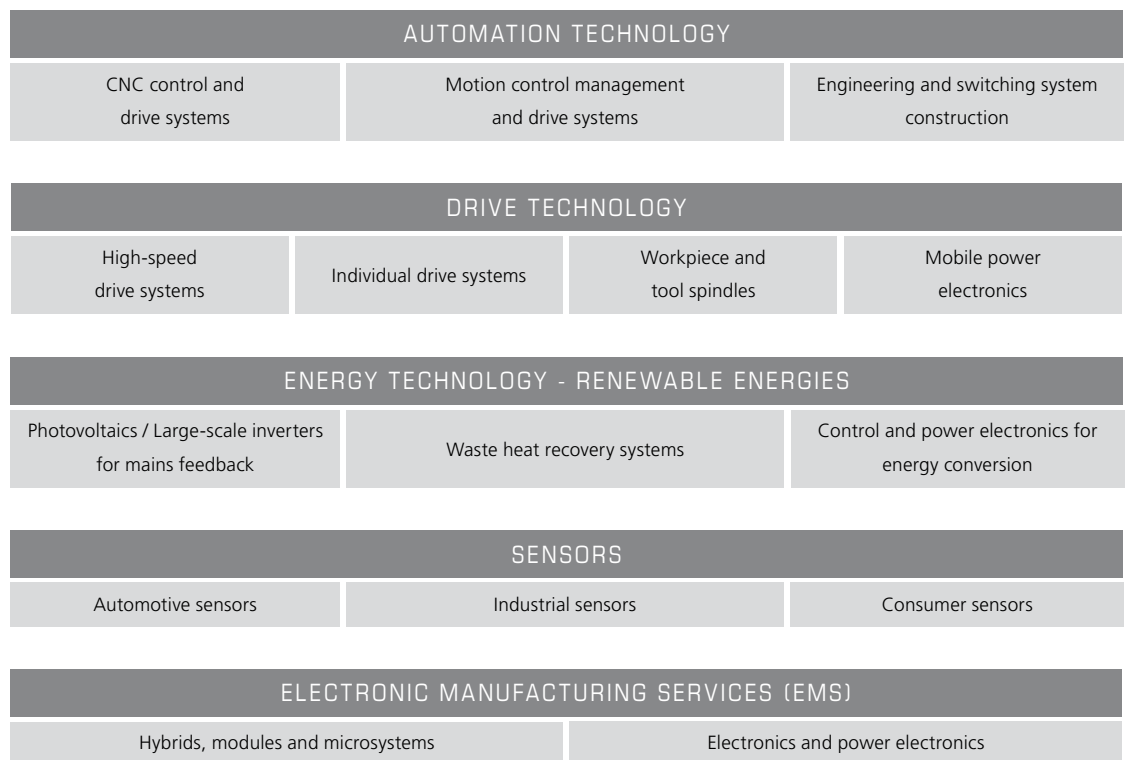
↑ Belt drive configuration



↑ Motion profile and load profile of an application

## LTi's new business units

**THE LTI GROUP** has split its activities into five business units. Within these business units, the strategic focus is divided into market segments where LTI holds a leading position in the market. The strategic segments include CNC Control- and Drive technology, Machine tool outfitting, Medical technology, Mobile power electronics, Automotive industry, Renewable energies (photovoltaics, wind power and biomass) and certain other segments with a strong future.



## New LTi Logos

In the future, we want our external image to be based on our different business units. For customers, our solution expertise and market focus is key. Then comes the question of who in the Group solves the customer's problem and how fast do we get in contact.

Despite their standardised basic design, the new logos of the companies in the LTi Group show the differences between the individual companies through the colour and icon, which allows their specialist area to be identified.



## Start for ORC plant from ADATURB at Villeroy & Boch

AT A CEREMONY held on September 15th at the Villeroy & Boch sanitary ware factory in Mettlach, the Environment, Energy and Transport Minister of the Saarland, Dr. Simone Peter, together with Dr. Wolfgang Lust from LTI and Villeroy & Boch Finance Director Jörg Wahlers, officially launched the operation of an ORC plant to generate electricity from the exhaust air produced by the factory's ceramic furnace.

The ORC plant was designed and installed by ADATURB GmbH & Co. KG in cooperation with specialist ceramic furnace contractor Keramische Ofenbau GmbH.

The hot air is produced in a so-called tunnel furnace, in which the ceramics are burned at a temperature of 1200 degrees Celsius.

The new process extracts the exhaust air from the cooling zone of the tunnel furnace and routes it to the energy recovery plant. In the direct heat exchanger of the ORC plant this waste heat is used to evaporate an organic coolant and generate a steam pressure of 17 bar. This steam drives the high-frequency generator, linked by a turbine. Electricity is generated, which Villeroy & Boch feeds into their grid. In the first phase the company expects this to make it some EUR 40,000 a year.

The ADATURB ORC plant operates in a power range up to 30 kW. It is without equal anywhere in the world. Most current ORC plants operate in a power range well over 100 kW.

The ORC plant will be running trials for about the next year, in order to attain maximum efficiency based on continuous optimisation.

Villeroy & Boch is also considering installing ORC plants in more of its facilities.

The Saarland's Environment, Energy and Transport Minister, Dr. Simone Peter, described the commissioning of the ORC plant as „the right signal to send out for the future.“

Achim Engelmann, Head of Production, LTI DRIVES ■



From left to right: Jörg Wahlers, Dr. Simone Peter, Dr. Wolfgang Lust

Source: Villeroy & Boch



↑ Source: Villeroy & Boch

fair

FAIR	DATE/LOCATION	EXHIBITOR
<b>SOLARPOWER</b> International Fair for Solar Energy <a href="http://www.solarpowerinternational.com">www.solarpowerinternational.com</a>	17.10. – 20.10.2011 Dallas/Texas, USA	LTi REEnergy USA
<b>AGRITECHNICA</b> International Fair for Agricultural Machinery <a href="http://www.agritechnica.com">www.agritechnica.com</a>	15.11. – 19.11.2011 Hannover, Germany	LTi DRIVES
<b>COMPAMED</b> International Trade Fair for high tech solutions for Medical Technologies <a href="http://www.compamed.de">www.compamed.de</a>	16.11. – 18.11.2011 Düsseldorf, Germany	LUST Hybrid-Technik
<b>SPS/IPC/DRIVES</b> Fair for Electric Automation Technology <a href="http://www.mesago.de">www.mesago.de</a>	22.11. – 24.11.2011 Nürnberg, Germany	LTi DRIVES LEVITEC Sensitec
<b>enerGaia</b> International Fair for Renewable Energies <a href="http://www.energaia-expo.com">www.energaia-expo.com</a>	07.12. – 09.12.2011 Montpellier, France	LTi REEnergy
<b>CCMT</b> International Fair for CNC Machine Tools <a href="http://www.ccmshow.com">www.ccmshow.com</a>	16.04. – 20.04.2012 Nanjing, China	Fiege
<b>Chinaplas 2012</b> International Fair of the Plastic and Rubber Industry <a href="http://www.solarexpo.com">www.solarexpo.com</a>	18.04. – 21.04.2012 Shanghai, China	LTi Drive Systems, China
<b>Hannovermesse</b> International Industrial Fair <a href="http://www.hannovermesse.de">www.hannovermesse.de</a>	23.04. – 27.04.2012 Hannover, Germany	LTi DRIVES, LEVITEC Sensitec, andron, Fiege
<b>PCIM Europe 2012</b> International Trade Fair and Conference for Power Electronics and Intelligent Drive Technology <a href="http://www.mesago.de/de/PCIM/home.com">www.mesago.de/de/PCIM/home.com</a>	08.05. – 10.05.2012 Nürnberg, Germany	Sensitec
<b>Solarexpo</b> International Exhibition and Conference for Renewable Energies <a href="http://www.solarexpo.com">www.solarexpo.com</a>	09.05. – 11.05.2012 Verona, Italy	LTi REEnergy
<b>SNEC 2012 PV Power Expo</b> International Conference and Exhibition for Photovoltaics <a href="http://www.snec.org.cn">www.snec.org.cn</a>	16.05. – 18.05.2012 Shanghai, China	LTi REEnergy Systems, China
<b>Sensor + Test</b> The Measurement Fair <a href="http://www.sensor-test.de">www.sensor-test.de</a>	22.05. – 24.05.2012 Nürnberg, Germany	Sensitec
<b>SPS/IPC/DRIVES/ITALIA</b> Fair for Electric Automation Technology <a href="http://www.sps-italia.net">www.sps-italia.net</a>	22.05. – 24.05.2012 Parma, Italy	LTi DRIVES

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Mail [info@lt-i.com](mailto:info@lt-i.com) · [www.lt-i.com](http://www.lt-i.com) · **Responsible for content:** Anni Tonigold, Johanna Berwanger-Gast, Thomas Stach

**Layout:** Johanna Berwanger-Gast