The customer magazine of the LTi Group

LTi INNOVATION

www.lt-i.com

ISSUE 26
November 2010

3 wheels 2 seats 1 goal

Winning with Mobile Power

Always a safe step ahead with LTi

Safe automation systems from LTi

Few companies in the industry devoted their attentions to the issue of safety engineering under the terms of the new Machinery Directive as early as LTi. It is a commitment from which LTi – and in particular its customers – have been able to profit considerably in 2009 and 2010. Over the last year-and-a-half, LTi has been providing its customers with a continuous stream of advice on safety engineering and the development of safe products in the field of drive and automation engineering. This has proved fruitful in delivering a major competitive edge – a fact also reflected in the above-average growth achieved by LTi in 2010. The company will this year surpass the high sales levels it attained in 2008.

The LTi Group – a safe partner for the future

LTi has been a safe, reliable and competent partner to its customers, suppliers and employees for almost 40 years, over which time it has maintained a consistently strong feel for market developments, the needs of customers and key technology trends. But being a strong, safe partner is also about maintaining financial stability, and it is about acting in a responsible manner, especially in times of crisis. We demonstrated all of those attributes during 2009.

Safety and sustainability

As a family business, our approach is based on different principles than those often applied by stock marked listed companies or organizations answerable to financial investors – and that difference frequently benefits our customers. A key attribute of a family-run business is the ability to invest at the right time and to create sustainable technological and commercial benefit for its customers. The statistics prove: family-run businesses have fared better in the crisis, and have been able to turn their performance around more rapidly.

You can trust in LTi, and with LTi you are always a safe step ahead.

Dr. Wolfgang Lust

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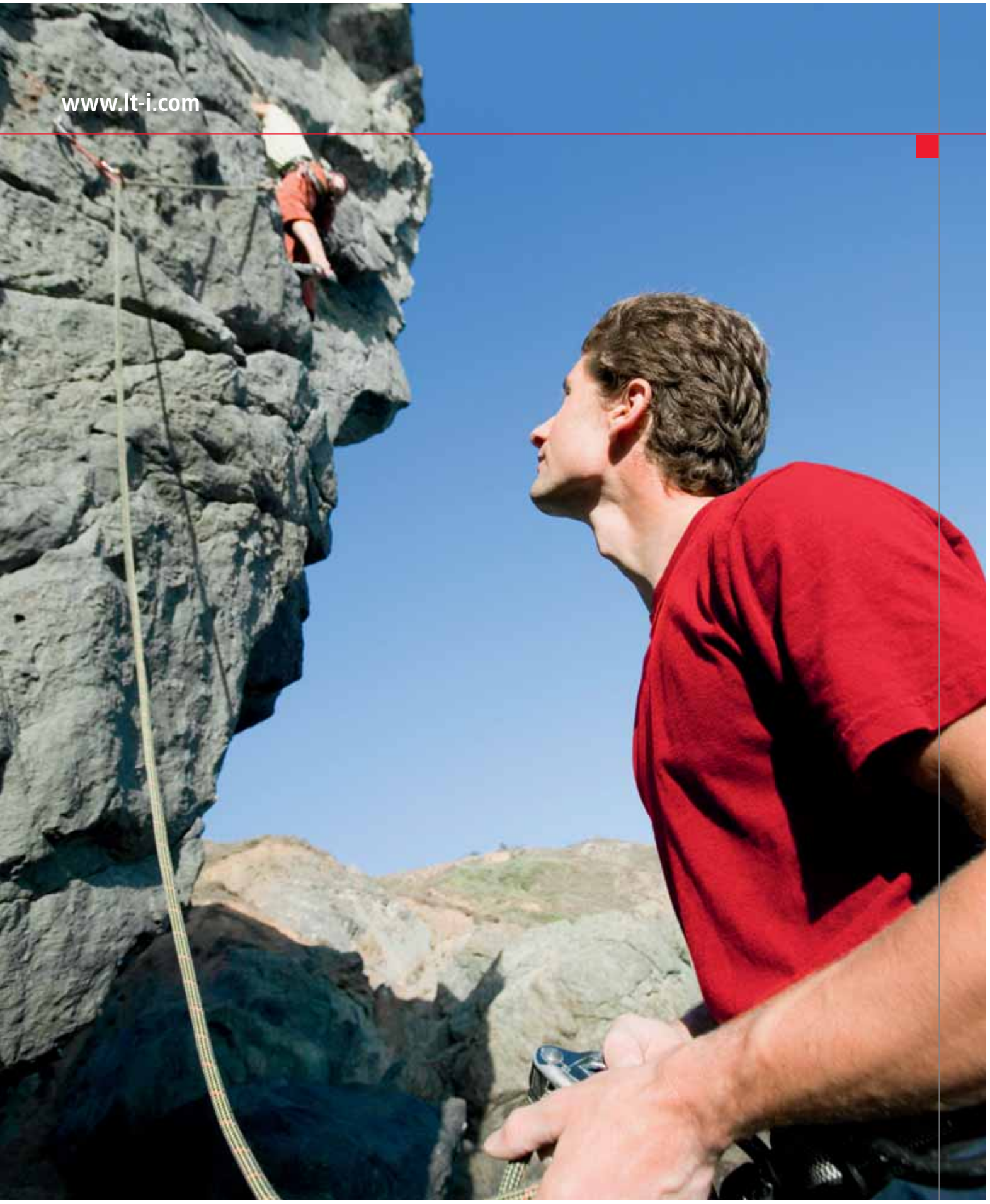


We make motion safe.

Utilize the safety solution of tomorrow right now – to boost your market appeal and gain a competitive edge!

LTi DRiVES
Member of LTi-Group

news

LTI REENERGY & DELTA ENERGY SYSTEMS

LTi REEnergy GmbH and Delta Energy Systems (Germany) GmbH have entered into a co-operation agreement relating to the ongoing development and production of photovoltaic central inverters for the American market. The agreement entails cooperation in expanding the product range and in establishing a 1 GW capacity production facility at the Delta location in Los Angeles. The facility will manufacture central inverters, based on the LTi PVmaster series, in the power range from 38 kW to 1 MW. Start of production of the first UL-approved inverters is scheduled for April 2011.

SENSITEC RECEIVES AWARD

On June 8, 2010, at a ceremony in Anaheim, California, Sensitec GmbH sales manager Joachim Achenbach received the Global Product Innovation Award from leading US market research organization Frost & Sullivan. Sensitec received the award for its AFF755 magnetic field sensor. The sensor is typically fitted as an electronic compass in smartphones, providing high-precision sensing of the terrestrial magnetic field. The annual award by Frost & Sullivan marks out the company which has delivered the single most innovative product development within a specific industry segment.

DR. WOLFGANG LUST ELECTED TO ZVEI

The Automation product division of the German Electrical and Electronic Manufacturers' Association ZVEI elected Dr. Wolfgang Lust, Managing Partner of LTi Drives GmbH, to serve on its executive board. The ZVEI represents the commercial, technological and environmental policy interests of the German electrical and electronics industry at national, European and global level. Dr. Wolfgang Lust commented on his new appointment: „I want to help our member-firms strengthen Germany's global competitiveness based on the development and application of new technologies. Organizations such as the ZVEI offer medium-sized enterprises the opportunity to bundle their strength and innovative power by networking in order to attain their goals more effectively."

3 wheels 2 seats 1 goal

Winning with Mobile Power

The victory ceremony for the 10-million-dollar Progressive Insurance Automotive X Prize was held on September 16, 2010 in Washington D.C. One of the winners of the international vehicle alternative drive system competition honoured at the event was the „TW4XP" team entered by E-mobile Motors GmbH based in Rosenthal in the German state of Hesse. Its three-wheeled electric vehicle, provisionally named „TW4XP" (Three Wheeler for X Prize), is powered by a drive system featuring a Mobile Power unit from LTi DRiVES.

The Automotive X Prize

The X PRIZE Foundation is a US non-profit organization which sponsors the Progressive Automotive X Prize, an international competition for the development of production-capable vehicles powered by alternative drive systems. The criteria for vehicles to be included in the contest were eco-friendliness, radically reduced fuel consumption of less than 100 mpg (2.35 litres per 100 km), and a minimum 10,000 unit production capability. The competing vehicles also had to be capable of attaining a top speed of 80 mph (130 km/h) and covering a range of 100 miles (160 km).

The X Prize was split into two competition classes: one for vehicles with four wheels and five seats, and the alternative two-seater class, which was in turn subdivided into tandem and side-by-side categories. The TW4XP team competed in the latter-named category. The knock-out tests making up the Progressive Automotive X Prize repeatedly put the vehicles to the test in terms of their acceleration, evasive steering and braking response, and their long-distance efficiency.

Only nine of the total of 140 competing vehicles at the start qualified through to the final stage. Eventually five of the qualifying vehicles battled their way into the last race, and of them only three made it over the finishing line – among them the TW4XP.

The TW4XP – efficient and production-capable

The TW4XP not only performs differently than conventional vehicles, it looks different too. The two-seater three-wheeler is accessed by way of a central lift-up hood. It is powered purely electrically, and consumes about 10 kWh of power per 100 km, corresponding to approximately 1 litre of petrol. That means the TW4XP consumes roughly half of the energy of current e-mobiles (mostly prototypes) produced by the established automotive industry. The vehicle's frame design combines light-weight construction with crash resistance.

The drive

The drive unit is built-in to the aluminium space-frame of the TW4XP. It comprises a synchronous electric motor with a power output of 17 Kilowatts (30 Kilowatts peak) combined with a LTi Mobile Power unit. The Mobile Power unit is designed specially to handle the demands of mobile applications, and among its features is the ability to feed battery power back into the supply grid – so-called „vehicle to grid", or V2G. In the near future V2G-capable vehicles might help to stabilize the grid or serve as power stores to speed up the spread of renewable energy, so making electric vehicles doubly eco-friendly.

This was the first in our two-part series titled „3 wheels, 2 seats, 1 goal". Check out the next issue to discover all the details of the TW4XP and its Mobile Power drive unit from LTi DRiVES.

With the kind assistance of E-mobile Motors GmbH
www.tw4xp.com
http://www.progressiveautoxprize.org/

Volker Kuhoff, Key Account Manager, LTi DRiVES

The TW4XP in front of the skyline of Chicago

TW4XP at a glance

- Top speed > 80 mph (130 km/h)
- Acceleration 0 – 60 mph (0 – 96 km/h) < 18 sec
- Range: > 100 miles (160 km) on one charge
- Consumption < 10 kWh per 100 km
- Battery: 706 V / LiNiMn
- Vehicle weight: 675 kg (prototype), < 500 kg (production)
- Motor technology: Synchronous-torque
- Motor power: 17 kW nominal / 30 kW peak
- Drive electronics: LTi Mobile Power unit with control functionality

The LTi DRiVES Mobile Power market segment

The LTi DRiVES Mobile Power market segment is all about fitting out electric vehicles and mobile machines with electric or hybrid drive systems. LTi's Mobile Power solutions incorporate the company's over four decades of development experience in the field of electric drive technology.

The renaissance of the resolver thanks to certified safety control

THE EVER-GROWING demand for safe, cost-effective motion control solutions is widening the scope of factors to be considered when selecting an encoder system. For single-turn encoders, resolvers are gaining in appeal once again, as they offer good safety features and enable solutions conforming to both PL d and PL e requirements.

This is where an old familiar encoder type comes into its own. By virtue of their simple design, resolvers offer a very good basis for safe monitoring of applications. The principle of the rotary transformer provides two physically separate channels in the encoder to form the encoder signals which are evaluated and monitored by the software via two safety controllers. Both safety controllers independently monitor the arc tangent and the electrical position of the resolver..

In order to exclude the possibility of any errors which may occur either in the circuit or in the software, more than 50 potential errors were identified, analyzed and rendered diagnosable by a variety of measures. It was on that basis that we implemented resolver evaluation up to SIL 2 / PL d for our safety controller series SMC1 and certified it as a type approval test. Despite their high safety levels, the various series remain very flexible, thanks to a variable exciter frequency and a selectable number of pole pairs.

Thanks to an additional resolver exciter signal monitor in the ServoOne with built-in safety features, the diagnostic coverage of the monitoring functionality can be increased to ≥ 90 %, enabling the ServoOne solution to be approved in accordance with SIL 3 / PL e.

In this way, new applications are repeatedly arising for resolvers, making this widely tried and proven encoder system an attractive option not only in terms of cost-effectiveness, robustness and reliability, but now also by virtue of its „very safe" classification

Julian Bodem, Product Manager, LTi DRiVES

„Curtain up!“ – for the Dynamic Duo from LTi

QUICK SCENE CHANGES; complex, reproducible movements at the press of a button. Modern-day stage control and event automation technology is quite on a par with the industrial sphere in terms of the demands it imposes – and in some instances goes beyond them. The primary concerns are safety and trouble-free operation.

The Qatar National Convention Centre

Batalpha, a leading manufacturer of event and stage control solutions, is currently working on a major project. The project involves supplying the mechanism and the control for over 300 drive units at the Qatar National Convention Centre, the largest centre of its kind in the Middle East, incorporating a theatre and various exhibition halls. Batalpha is acquiring its drive and safety engineering components from a single source – namely LTi DRiVES.

The duo being deployed comprises the high-end ServoOne servocontroller and the external Safe Monitoring Control (SMC).

The ServoOne is a state-of-the-art drive controller incorporating the Safe Torque Off (STO) safety function to SIL 3 and PL e/category 3. The motion control and position monitoring functions additionally required are contributed by the freely programmable SMC. Additionally available safety functions, such as Safe Emergency Limit, even allow previously needed safety limit switches to be omitted.

Stage control applications impose specific demands in terms of acoustics above and beyond the required safety functions. Disturbing motor noise must be minimized for example. This is achieved by the high switching frequency of the ServoOne, which at 16 kHz is well beyond the audible range.

The drive controller can also be customized to the specific requirements of the application. For example, potential interference frequencies (resonance) can be suppressed by additional filters. For optimization and commissioning purposes, a digital oscilloscope is implemented on the ServoOne user interface.

Whether for plenary debates, for auditorium lectures and speeches, for artistic presentations on stage or simply to provide a pleasant ambience for a banquet meal – the ServoOne/SMC duo is sure to play a key role.

With the kind assistance of batalpha Bobach GmbH
www. batalpha.com

Christian Leng, Applications, LTi DRiVES

Safety functions with ServoOne and SMC

The ServoOne incorporates the Safe Torque Off (STO) safety function certified according to PL e / category 3 as per EN ISO 13849-1 and SIL 3 as per EN 61800-5-2, EN 62061 and IEC 61508.

While the ServoOne is handling its motion control tasks it is monitored by the external SMC with no impact on its performance. This enables motion control as well as position monitoring up to PL e / category 3 and SIL 3. Alongside safety functions specified in DIN EN 61800-5-2, the SMC also offers safety functions arising from market demands. The Safe Emergency Limit (SEL) safety function, for example, monitors observance of the travel range. The usually needed safety limit switches can be omitted.

Safe encoders: the sensory organs of motion control

MODERN-DAY maschinery manufacturers are confronted by a wide range of challenges, reflected in the increasing spread of terms such as „performance level“, „diagnostic coverage“, and the need to conform to standards such as the EU Machinery Directive. In order to build and sell safe machines, safe system components are key. Safe encoders, serving as the sensory organs of components subject to functional safety demands, are essential links in the safety chain.

Only by reliably recording speed and position data is it possible to safely monitor velocity, standstill or other motion control solutions. While many product standards cite a performance level (PL) d for rotary or horizontal axes (such as EN12417 machining centres), applications involving inclined or lift axes, and press applications, mostly specify PL e.

This begs the question as to how machinery manufacturers can implement these safe monitoring functions with the specified PL on their machines.

In addition to its functional safety products (ServoOne, SMC), LTi DRiVES supplies motors with safe encoders. The special feature of this is that it encompasses not only the certified encoder, but rather the complete process, from safe mounting through to testing and documentation of the interface. When an encoder of this kind is deployed – even with PL e certification – it must be mounted with 20 times over-dimensioning in order to meet the fail-safety requirements of the safety standard DIN EN 61800-5-2. And other requirements may also need to be met, such as the manufacturer's implementation rules. Such measures make it possible to integrate a comprehensively certified system into the machine.

Things become more difficult when existing machinery concepts are to be retained unmodified.
This is quite justifiable, because in the linear and direct drives segment there are no certified encoder systems based on the current state of development. For such cases, the above components offer the possibility to evaluate a second, redundant encoder so that fault detection by the process can eliminate the need for the aforementioned fail-safety and the specified safety level requirement can be met. In applications to PL d standard, diversity is a commonly used method, and will be presented in similar form in the future second release of DIN EN 61508 (see BGIA Report 02/08, section 6.3)

LTi DRiVES thus enables users to rely virtually blindly on the sensory organs of the motion control system – regardless of whether certified or uncertified, one- or two-channel systems – and so embed machine safety into their processes.

Daniel Seibel, Applications, LTi DRiVES

Flying saw – an old process opening up new possibilities

THE SO-CALLED „flying saw" is less dangerous than its name might initially suggest. The object of the application is to cut an endless material – used in the production of a steel pipe, an aluminium sheet or paper for example – to a specific length during live operation, while the material is continuously flowing. In the process, a circular saw is run synchronously with the material and is able to saw through it orthogonally to the direction of movement.

Practical examples of such techniques extend as far back as the early days of digital drive technology. However, the essential basic functionality has since been supplemented by a range of secondary demands, such as maintenance-friendliness, user-friendliness, the ability to use standard equipment, the facility to alter parameters online, or material-protecting (jerk limited) start-up and engagement and disengagement of synchronous running mode.

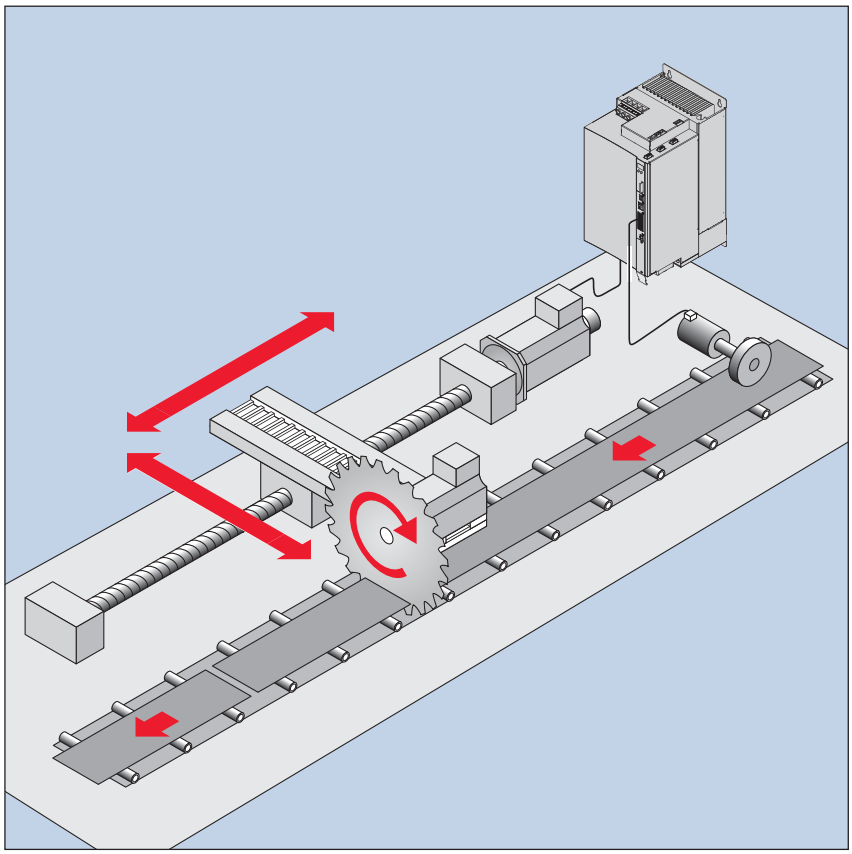
Flexibility based on iPLC

The iPLC programming environment integrated into the ServoOne enables existing functions to be accessed from a Motion Library.

One of those functions is the „electronic cam plate", which essentially ensures synchronism between the material and the carriage transporting the saw, with jerk-free engagement and disengagement of synchronous running mode. The „flying saw" functionality can be extensively parameterized: All necessary parameters can be entered, including the cut length, the cut mark function and the return mode – optionally along the cam plate or via the internal profile generator.

This variant of the flying saw is being used by a customer of LTi DRiVES CO., LTD in Taiwan for example. Thanks to the ease of parameter setting programmed into iPLC, the commissioning process was also completed without problem. The results achieved in subsequent production surpassed all expectations.

Daniel Breimhorst, Applications, LTi DRiVES



Schematic of the flying saw

Objectively speaking…

ADMITTEDLY, compact digital cameras are very practical, being quick to pack away, cheap to buy, and easy to use. But anyone looking for top picture quality and seeking to produce spectacular images is bound to opt for a high-end DSLR (Digital Single Lens Reflex) camera with interchangeable lenses. With its new S2 professional camera, Leica has marked one of the major milestones in the company's history: the first production Leica with autofocus.

The S2 camera is a ground-breaking new system within the medium-format segment, featuring a 30 x 45 mm sensor and 37.5 megapixel resolution. Yet its body is only the size of a small-format professional camera. A range of new lenses have been developed to go with the camera. As the Leica S2 is much smaller and lighter than other medium-format systems, and shoots at high speed despite the very high resolution of its image sensor, it is not only suitable for studio work but is terrific for location shoots too. A revolutionary feature for Leica is the ultra-fast and precise autofocus. Its precision is attributable, among other factors, to its two Sensitec MR (magneto-resistive) sensors which form part of the encoder system for absolute positioning in autofocus mode

Leica relying on MR technology

The sensors are installed in the lens on an electronic circuit board with an integrated signal pre-processor to read the scale mounted in the lens. The sensors' function is to measure the rotation of two cylinders, from which the position of the lens group and thus the range setting is calculated. The sensor data is processed by a dedicated lens microcontroller. The lens must be capable of measuring the range very precisely so that the motor can stop at exactly the right point. To do this, Leica is using a high-precision measurement technique, based on the MR effect, which is new to it. The method involves applying a thin strip of ferrite material to the rotating inner part of the lens which the MR sensors are able to detect to an accuracy of five micrometres – much more precisely than a person could ever turn the range-finder ring. Key criteria in selecting the components included the need for rapid delivery of the absolute position and the fact that the measurement method is a non-contacting, non-wearing technique. The sensors, combined into a single module, have proved to be the ideal choice, being compact and allowing easy adjustment.

Ellen Slatter, Marketing, SENSiTEC

Source: Leica Camera AG

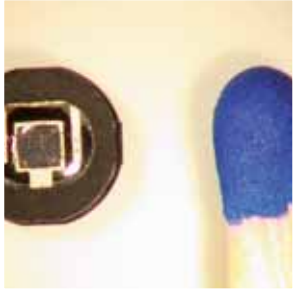
LUST Hybrid-Technik R&D technology development cooperation project

ADVANCING KEY technologies is a major factor in maintaining and developing the innovative capability of a business. It was under that premise that LUST Hybrid-Technik GmbH entered into a R&D cooperation project with the Fraunhofer Society IZM-Berlin in 2009. The project is named „MikroProJet", and relates to the improvement of micro-electronic production technologies based on non-contact jet dispensing.

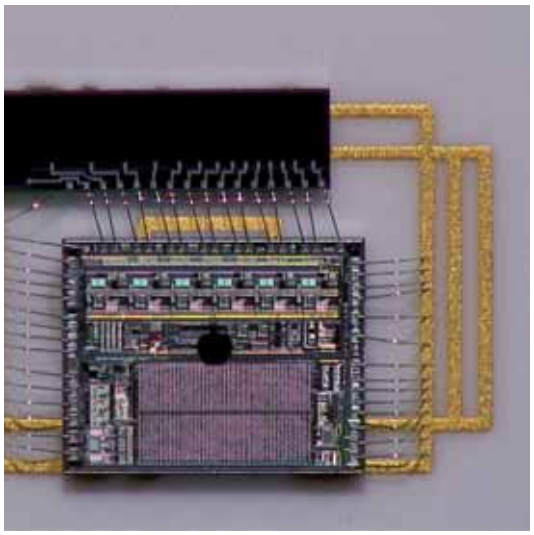
The aim of the joint project is to develop a new method enabling micro-electronic – and in particular also opto-electronic – assemblies to be encapsulated in a precise, non-contact way. The jet method is not yet in widespread use in component assembly and connection technology. The established needle dispenser technique is still the primary method used, though as the miniaturization of micro-electronic components advances it is increasingly reaching its physical and process limits.

The jet method offers key advantages in terms of the geometric precision of the applied Encapsulation and potting media, and its capabilities include dispensing of very small quantities (< 1 µl) with high volume constancy. Its high dispensing rate (up to 1000 dots per second) means much shorter process times can be expected.

The main challenge facing the IZM is to find suitable processing parameters, such as adhesive, for the highly viscous, largely abrasive underfilled coating materials (Glob-Top) and to characterize the approximately 12 different material groups in terms of their deformation and flow behaviour.
The main tasks of Lust Hybrid-Technik are to implement and verify the applicability of the results in producing existing modules and for future developments, as well as to characterize the relability of demonstrators.



← Transparent potting of a power LED with 5.5 µl potting compound



← 3D-demonstrator for partial potting by jet dispensing

The Lust Hybrid-Technik project team comprises staff from the Production and Technology departments, so as to ensure rapid, efficient implementation of the technique on completion of the project.

Karl-Heinz Lentzy, Head of Technology , LUST Hybrid-Technik

>> In the machine tools sector, LTi offers an extensive product portfolio, many years' experience and industry-leading technology know-how. Whether single components or complete solutions – LTi can provide everything from one source: from high-precisi-

CNC controls from andron optimize the production of precision tools

WHEN IT COMES to grinding tungsten carbide special tools, manufacturers cannot rely on standard solutions. A complex geometry for the grinding machine has to be programmed specially for each precision tool. Despite this, the time needed to configure the systems has to be minimized so as to keep the production process cost-effective. To optimize this costly and complex production process, precision tool company Neuhäuser Präzisionswerkzeuge GmbH relies on flexible, freely programmable CNC controls from andron GmbH.

Cutting tools ➡

At its facility in Prüm in the West Eifel region of Germany, Neuhäuser makes the highly versatile grinding machine needed to manufacture its metalworking tools itself. It is an unavoidable commitment, as there are no systems on the market meeting the company's specific needs. Neuhäuser specializes in the production of custom sawing, milling and cutting tools made of HSS or HSS-cobalt and solid carbide. Thanks to the use of in-house machine tools, the company is able to meet state-of-the-art standards and deliver continuous improvement.

It uses andron CNC controls to manufacture special tools, such as special side and face milling cutters with applications in a wide variety of fields – from titanium and aluminium working in the aerospace industry, through commutators in the electronics industry, to hydraulic components for the automotive industry. Managing Director Klaus-Dieter Neuhäuser cites two main benefits: „The andronic controls allow us to work with parameterized programs. This means operators only have to enter the relevant dimensions – and that is a great time-saver in the production process for milling cutters for example. Moreover, they enable us to operate multiple axis sets simultaneously and independently, meaning different production stages can run in parallel – which is a great boon both in terms of speed of production and cost."
The great flexibility and high precision of andronic controls means new configurations can be quickly and efficiently implemented on the machines.

Alexander Pasternak, Product Communications, andron GmbH

⬆ Surface grinder for flat and hollow grinding of disk-shaped cutting tools
Source: Neuhäuser Präzisionswerkzeuge GmbH

on mechanisms (such as high-frequency motor spindles), through highly dynamic drive controllers, to programmable logic control systems. This comprehensive know-how enables us to provide our customers with individually tailored, cost-optimized solutions. <<

Spindle technology from Fiege – the right choice for highly specialized customer demands

THERE HAS BEEN a trend for a number of years in manufacturing industry to reduce times spent on non-production operations (tooling, programming, setup, loading, etc.) by complete machining of workpieces in one setting. This requires that machines be designed not just for a single machining task, such as grinding or drilling, but to handle a wide range of different processes.

A multi-functional machine tool of this kind is the Stöckel FSG Universal combination grinding machine, which is able to combine flat and circular grinding based on a swivelling main spindle design. As a result, the machine's capacities are utilized to the maximum, enabling rapid amortization and delivering higher product precision.

The basis for the machine tool's main spindle was provided by a spindle from the standard 910 series by Fiege KG, adapted to the highly specialized demands of the customer. The dimensions of this compact spindle unit are 180x180x400 mm, with a torque of 26 Nm at 2500 rpm and a maximum rotation speed of 4500 rpm. The compact direct drive comprises a built-in synchronous motor with integrated speed sensor system, driven by the SpeedChampion high-frequency servocontroller – two optimally matched components from LEViTEC. To support the spindle Fiege uses four special spindle bearings, providing sufficient stability even when working on large grinding wheels in 400mm diameter.
The sealing system of the spindle unit is a proprietary labyrinth design featuring a barrier air system on the tool side, to protect the bearings and the complete motor spindle against incursion of coolant and grinding sludge.

The optimally coordinated design, comprising the main spindle, integrated motor and high-frequency servocontroller, enables outstanding surface qualities of Ra 0.05µm to be attained on the workpieces.

Mathias Fiege, Managing Director, Fiege

← Motor spindle swung into machine

Less maintenance – more efficiency

Turbo-compressors from Piller rely on magnetic bearing technology from LEViTEC

THE NEED FOR clean water poses an enormous challenge all over the world. In Germany, alone, more than 10,000 treatment plants process some 10 billion cubic metres of sewage every year. The Piller Industrieanlagen GmbH company based in Moringen has developed a turbo-compressor – the PillAerator – which supports biological sewage treatment in an optimum way. Equipped with a maintenance-free magnetic bearing mounted drive unit from LEViTEC, the PillAerator operates at high efficiency levels and so delivers maximum energy efficiency.

Sewage is treated in state-of-the-art plants by a multi-stage process: After an initial coarse mechanical cleaning comes a biological cleaning stage in which biological impurities are removed by the addition of oxygen. In this process, the PillAerator ensures optimum oxygen supply to the sewage.
As the sewage is aerated round the clock, there is major potential for saving – though this does require optimum control of the aeration process.

Maximum energy efficiency based on optimized speeds

In contrast to the rotary piston blowers previously used, the Piller turbo-compressor delivers maximum energy efficiency thanks to the optimized compressor operating principle, the high-efficiency motor and the frictionless magnetic bearing technology.
The PillAerator controller communicates via PROFIBUS with the LEViTEC magnetic bearing electronics and the LTi DRiVES drive electronics – two optimally matched components from the LTi Group. This enables the speed to be optimized by means of complicated control algorithms. The sensors built-in to the magnetic bearing continuous record the operational status of the compressor, enabling the complete treatment plant to be run always at the optimum operation point and ensuring that no more than the required quantity of oxygen is ever fed in.

All relevant operating parameters, such as the volumetric flow and outlet pressure, can be viewed and evaluated by the customer online over a wireless GPRS link.
The magnetic bearing mounted (and thus contactless) PillAerator requires no lubricant, which means the system is practically non-wearing and maintenance-free.

The positive fruits of the collaboration between LEViTEC and Piller begun back in 2005 are demonstrated by the success of the PillAerator, which is founded largely on LEViTEC's years of specialist experience and on the innovative compressor technology of Piller.
The PillAerator has now gone into mass production, and is being marketed worldwide by Piller GmbH.

With the kind assistance of Piller Industrieventilatoren GmbH
www.piller.de

Matthias Kroll, Managing Director, LEViTEC

Source: Piller Industrieventilatoren GmbH

⬇ PillAerator

Frequency inverters from LTi provide the right cooling for TRUMPF TruDisk lasers

Beam guidance

TRUDISK LASERS are the ideal tools for welding and cutting in many fields, including in the automotive industry and in medical technology. Optimum water-cooling of the laser is ensured by a compact drive system from LTi DRiVES.

Solid-state lasers are top performers wherever metals need to be machined to a high standard and continuously high power outputs allied to very high beam quality are required. With laser power outputs of up to 16 Kilowatts and very high beam qualities of more than 2 mm*mrad, TRUMPF Laser in Schramberg makes the world's most powerful fibre-guided solid-state lasers. The advantage of them is that the laser beam can be guided by flexible fibre-optic cables. This enables the lasers to be integrated into production lines deploying industrial robots and other handling systems. TRUMPF disk lasers are modular in design, enabling users to connect up to six fibre-optic cables.

The CDB3000 is both: high-performing and energy-efficient

Wherever high power is generated there is heat loss and waste heat. Consequently, the TruDisk lasers have to be cooled with water. The CDB3000 frequency inverter from the LTi DRiVES c-line series ensures optimum water cooling during laser operations, thereby meeting TruDisk laser users' demands for ever more compact and powerful systems. The LTi frequency inverter features a cold plate, enabling the unit to be mounted directly on the active cooler in the switch cabinet. The switch cabinet is integrated into the overall system, and is not visible to the customer. The water cooling drive system is controlled over the CANopen bus system. All process parameters are available and modifiable online. In the event of faults, this enables TRUMPF staff to access the system by way of the Teleservice facility and so provides quick assistance to the customer. Software functions such as system phase failure and motor phase failure monitoring provided by the CDB3000 frequency inverter eliminate the need for external components. The frequency inverter also minimizes the cooling pump speed when the laser is not operating. This provides for a further improvement in the socket efficiency of the beam source.

With the attributes described, frequency inverters play a key role in the design of compact, energy-efficient lasers.

With the kind assistance of TRUMPF Laser GmbH + Co. KG
www.trumpf-laser.com

Peter Burger, Key Account Manager, LTi DRiVES

Energy efficiency at LTi ELECTRONiCS

LTI ELECTRONICS HAS been operating as an EMS (Electronic Manufacturing Services) provider from the Lahnau location since April 2009. In devising a suitable energy concept for the new LTi ELECTRONiCS head office, the key issue was to ensure optimum use of primary and secondary energy.

Following the submission of some initial designs by heating and air-conditioning contractors based on traditional heating systems with oil burners and electric air-conditioning units, an air-conditioning and ventilation consultant was ultimately engaged to devise the most energy-efficient concept possible for the new facility. The plan had to incorporate the existing electronic production machinery, including for example soldering machines, soldering irons, drying ovens and compressors, as well as taking into account a potential future expansion of the machinery portfolio.

The overall air-conditioning and ventilation concept comprises lots of single elements. The key components are the five gas heat pumps on the roof of the LTi ELECTRONiCS building. In conjunction with a triple-conductor system, they are able to simultaneously generate cold and heat. The heat pumps are activated and deactivated as required. This means that only the energy needed at any given time is generated.

Another major element of the energy concept is heat recovery by way of heat exchangers. In this process, the exhaust air from the factory hall is routed to heat exchangers and is used to heat the fresh air flowing in from the outside. The same method is applied to the waste heat from the soldering machines and the compressed air compressor. And even the waste heat from the inverters of the photovoltaic plant is used to heat the incoming fresh air.

The volume of fresh air drawn in is kept greater than that of the discharged air, so as to create an overpressure and to prevent dirt from penetrating the electronic production. The system also enables the temperature to be regulated separately within individual production areas.

In financial terms, too, implementing the energy concept has proved well worthwhile. The installation costs were no higher than for a conventional heating and ventilation system. The operating cost per square metre has to date been very low.

A comparison shows that the consumption of primary energy – that is, oil or gas – by an electric heating or air-conditioning system is around 278%, while with a gas heat pump it is just 80 %, referred to the same heating or cooling power.

Eberhard Schmauch, Managing Director, LTi ELECTRONiCS

PVmaster – First trade fair showing in India

AFTER HAVING BEEN shown at major international trade fairs in Europe, the USA, China and Taiwan, at the end of October LTi REEnergy for the first time presented its PVmaster central inverter series at a fair in India. The fair, featuring some 600 exhibitors from 40 countries,, was held from October 27-29, 2010 in New-Delhi, following on directly from the DIREC 2010 international renewable energy conference.
Visitors to DIREC 2010 had the opportunity to find out all about the LTi REEnergy PVmaster series for medium to large sized PV parks on the stand of the LTi German-Indian delegation. By marketing its product portfolio on the strategically important Indian PV market, LTi REEnergy will be able to build further on the international success of its innovative central inverter series.

Working on the island: PVmaster in Taiwan

IN EARLY September of this year, LTi REEnergy put into operation the first LTi PVmaster unit delivering a 68 KW AC rated power output in Taiwan. The 64.8kWp solar power plant located in Taichung, the third largest city on the west coast of Taiwan, comprises a total of 540 thin-film solar modules converting the energy of the sun into valuable electricity for the island.

The successful commissioning of the first PVmaster unit in Taiwan is the perfect foundation for us to drive further growth in the PV segment.

Innovative automation solutions + high-performance drive and safety engineering from LTi

Automatic roll changer

TEAM ELECTRONICS is a supplier of electronic and electrical equipment to machinery manufacturers in the printing, packaging and pharmaceuticals industry, medical technology and the CNC field. For its drive systems the company, based in the Vorarlberg region of Austria, has for the last year-and-a-half been relying on the high performance of LTi.

In the Summer of 2010 TEAM ELECTRONICS and LTi AUSTRiA jointly produced an automatic roll changer for printing machines. The benefit of the new system to end-user customers is that it eliminates machine downtimes for loading-in new rolls of paper or film. TEAM ELECTRONICS and LTi AUSTRiA worked closely together over a period of months, from dimensioning of the drives through to commissioning of the prototypes.

The entire dimensioning process was handled by LTi AUSTRiA using Servosoft. In consultation with the LTi DRiVES Applications and Development departments, the project came up with cost-optimized solutions perfectly meeting the technical requirements. For example, DC/AC axis modules were paired with AC/AC drives from the ServoOne series to ensure energy exchange between the reeling and unreeling modules of the roll changer.

A safe investment for the future

For its safety control system, Team ELECTRONICS has chosen the SMC-Z10 from LTi. The plan in future is to use a SMC-Z30, because in practice the machine can be run with the door open, and that requires a safely limited speed.

In view of the safety requirements imposed by the new EU Machinery Directive, TEAM ELECTRONICS is also likely to be extremely interested in the ServoOne Safety, as it is capable of handling the safety-related tasks of a master controller.

Yet more proof that innovative automation solutions from TEAM ELECTRONICS matched with high-performance drive and safety engineering from LTi make a perfect combination!

With the kind assistance of TEAM ELECTRONICS GmbH
www.team-electronics.com and
Kocher + Beck GmbH + Co. Rotationsstanztechnik KG
www.kocher-beck.de

Markus Weißensteiner, Head of Sales Austria, LTi AUSTRiA

Delivering ever more powerful lithium-ion batteries with EtherCAT and ServoOne

LITHIUM-ION BATTERIES are nowadays increasingly being used in a variety of power-hungry mobile devices. In order to manufacture batteries with higher power density, the production plant has to meet ever more stringent technical standards.

For Shenzhen Grant Technology Co., Ltd., one of the major suppliers of lithium-ion battery production plant in China, the challenge was to improve the performance of its machinery, in particular with regard to motion control – a challenge which the company struggled to meet with its existing control system. Against that background, Grant Technology developed a new generation of intermittent-running coating machines based on LTi ServoOne junior drive units, a motion controller, and EtherCAT technology for the motion control network.

The intermittent coating machine applies the suspension for the positive or negative electrode to the aluminium foil. The key feature of this plant is its ability to maintain a consistent suspension coating thickness. A total of eight servo-axes are synchronized precisely to the virtual master-axis with a cam or gear wheel profile via EtherCAT. The consistency of thickness has been improved by 5 % compared to the previous coating machine, while at the same time the use of EtherCAT has greatly enhanced efficiency in installation and commissioning of the servo system. „This control system, particularly the motion control technology, is a great help to us. It will become our standard for the design and development of new machines," comments Wang Hairong, Head of the Electrical Engineering Department of our customer Shenzhen Grant Technology., Ltd.

Liu Zuochun, LTi Drive Systems (Shanghai) Co. Ltd.

ServoOne junior familiy ➡

book

I'm going to be offline then
Christoph Koch
State-of-the-art communications are now an integral part of our everyday lives. More and more people are spending ever longer periods of time online. But what would an offline life be like? With no Facebook, no Google, and no phone or texting? By way of an experiment, Christoph Koch – a journalist and self-confessed online-junky – pulls the plug to discover what a life offline is like: 40 days with no mobile phone or Internet.
Verlag Blanvalet 2010, ISBN 978-3-7645-0374-1

fair

FAIR	DATE/LOCATION	EXHIBITOR
electronica World Trade Fair for components, systems and applications www.electronica.de	09.-12.11.2010 Munich, Germany	LUST Hybrid-Technik Sensitec
China Solar PV International Conference and Exhibition for solar and photovoltaics www.solar-pv.com.cn	18.-20.11.2010 Nanjing City, China	LTi REEnergy China
SPS/IPC/DRIVES International Fair for electric automation technology www.mesago.de/de/SPS/main.htm	23.-25.11.2010 Nürnberg, Germany	LTi DRiVES LEViTEC Sensitec
enerGaia International Renewable Energies Exhibition www.energaia-expo.com	08.-11.12.2010 Montpellier, France	LTi REEnergy
SNEC International Exhibition and Conference for solar and photovoltaics www.snec.org.cn	22.-24.02.2011 Shanghai, China	LTi REEnergy China
Energissima Swiss Fair for Renewable Energies and new technologies www.energissima.ch	13.-16.04.2011 Fribourg, Switzerland	LTi DRiVES Schweiz
Hannover Messe International Industrial Fair www.hannovermesse.de	04.-08.04.2011 Hannover, Germany	LTi DRiVES LTi REEnergy LEViTEC Sensitec
SOLAREXPO International Exhibition and Conference for Renewable Energies & distributed generation www.solarexpo.com	04.-06.05.2011 Verona, Italy	LTi REEnergy
SPS/IPC/DRIVES/ITALIA International Fair for electric automation technology www.sps-italia.net	24.-26.05.2011 Parma, Italy	LTi DRiVES

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