ServoOne

The art of drive engineering

LUST | LTi

ServoOne

German universities and scientists have repeatedly set the international standard in drive technology. Identification and active compensation of natural frequencies in oscillatory mechanics, status controls with monitoring structures incorporating acceleration sensors, adaptive compensation of measurement system deficiencies, self-adjusting detent torque compensation … everything invented with only a single aim in mind: to continue improving the motion control, dynamics, precision and processing speed of your machines. Of course laboratory test rigs and scientific publications are not enough for this. These features need to be converted into cost-efficient and easily manageable products. That's exactly what we have done.

So in future, if you should need more than today's market can offer you, just lean back and relax. With our new high-performance ServoOne drive series you will experience things that until now you've only read or heard about.

ServoOne. The name sets standards.


LUST
Servo one

ServoOne _ Modular functions at a glance

The modularity of the ServoOne guarantees you an optimum connection to the machine process. Whether it's a high-speed field bus communication with the central multi-axis machine control or with a decentralised programmable motion control intelligence in the drive controller, the ServoOne masters both with flying colours. Take a look at the details below – you will be surprised at the ServoOne's comprehensive equipment and how useful its future-proof features are for your application.

It goes without saying that you can also expect from us a well-established and target-oriented advisory service, competent support at commissioning, well though-out requirements-oriented ordering and delivery logistics, outstanding service and diagnostics capability and last but not least high product quality.

Servo drives from 4-170 A with AC or DC infeed
optionally with the classic AC mains connection or a DC infeed with central infeed unit

High-speed communication
to a wide variety of controls by field bus connection (SERCOS, EtherCAT, CANopen, PROFIBUS, ...)

Self-contained horizontal communication
within a ServoOne axis combination at the highest level (180 usable data rate on an EtherCAT basis)

PLC integration to IEC 61131
permits functions matched to the application with direct access to the drive controller periphery, Single and multi-axis blocks to PLCopen

Integral functional safety to IEC 61508
ensures the safety of personnel directly at the drive controller

Evaluation of up to 3 encoders
for spot-on positioning with sloppy mechanics using resolvers up to precision sin/cos single and multi-turn encoders

Compact design
suitable for 300 mm control cabinet depth, extremely narrow casing width for optimum use of space within the control cabinet

Future-proof
thanks to a flexible extension concept

Coordinated software package
with motion control functionality for any application

MMC card
permits easy data programming and firmware exchange

DriveManager 5
for PC-supported parameterisation and programming of multi-axis drive systems


LUST
Servo one
ACHTUNG
WARNING

Dynamic _ Control technology that's out of this world

Precision _ Spot on target

Communication _ A good connection every time

Safety technology _ Optimally integrated

ServoOne incorporates the most advanced control algorithms that have yet been devised, in order to satisfy the highest demands for dynamic response and smoothness. So it comes as no surprise that the ServoOne can drive a wide spectrum of motors, from synchronous servomotors through asynchronous motors to linear and torque motors.
High control sampling frequencies of 16 kHz for the current and 8 kHz for the speed and position lead to minimum dead times and thus guarantee optimum motor control. If the profile instruction cycle time is longer than 125 µs ServoOne offers the options of interpolating the position quadratically or cubically.
Predictive pre-control structures for speed and torque lead to optimum control behaviour. Higher order filters dampen the mechanical vibrations induced by resonant frequencies.
Automatic commissioning and control optimisation even whilst the drive is running allow consistently high manufacturing quality.

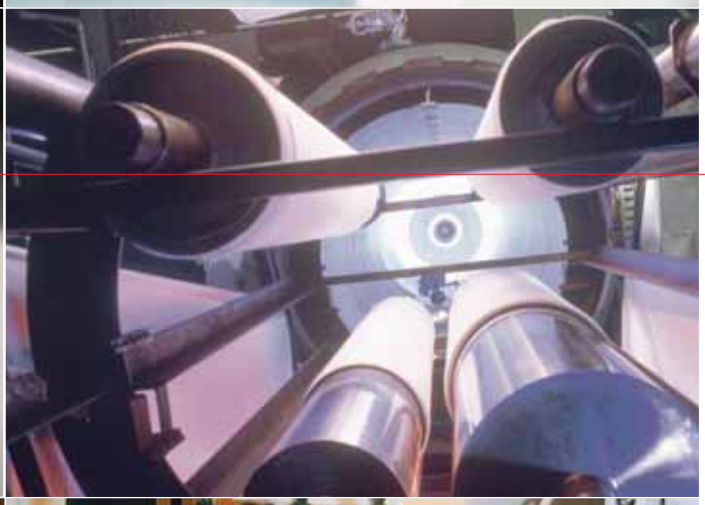
Flexible and modular encoder concepts together with electronics immune to interference, coupled with mature software, form the basis on which ServoOne performs high-precision movement control duties.
ServoOne is able to evaluate a wide spectrum of encoders. Of course this includes resolvers such as sin/cos single and multi-turn encoders.
Axis synchronism and positioning accuracy are optimised by various different compensation and correction processes.
They include the patented LTi GPOC synchronism improvement process. This checks the analog encoder signals directly for offset, phase, gain and eccentricity errors, and corrects those errors. Motor detent torque compensation reduces the static and dynamic torque ripple and thus also contributes to optimum synchronism. Smooth quadrant transitions are ensured by frictional torque correction. As a final feature, the correction of mechanical shaft manufacturing tolerances is direction-specific, thus increasing the absolute positioning accuracy.

Modern communication interfaces support the motion control functions and are part of the basis of the ServoOne. Rapid multi-axis movements are performed using the SERCOS II or EtherCAT motion control busses . These permit synchronous control of the ServoOne with a cycle time of 125 µs and axis synchronisation with a jitter of less than 1 µs.
Connections to other field bus interfaces such as CANopen or PROFIBUS permit integration into a very wide range of automation solutions.
Within a self-contained ServoOne axis combination, horizontal communication is available on an EtherCAT basis at 180 MBaud usable data rate. Setpoint coupling between axes can thus be achieved within a single control cycle.

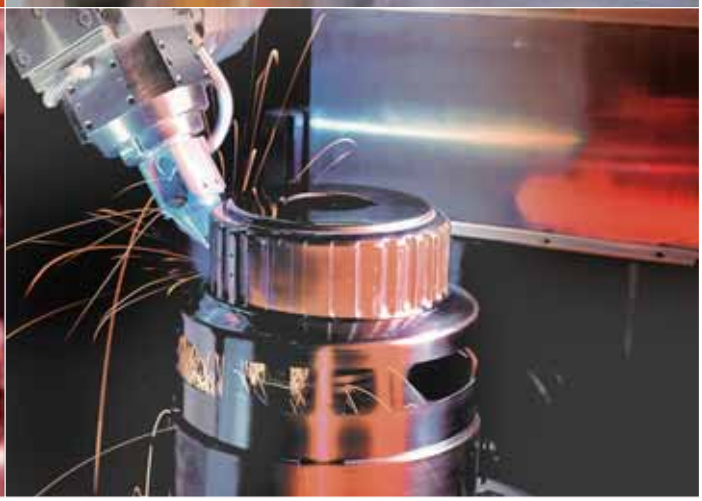
For PC-supported commissioning and diagnostics a USB interface is provided for simple "Plug and Play" use. The additional integral Ethernet interface permits all this even within a networked system.

Integrated operational safety functions permit additional external hardware components to be eliminated, thus reducing the wiring requirements.
The "STO" (Safe Torque Off) function to EN 954-1 category 3 (equivalent to PL-d or SIL2) is incorporated in the unit as standard. This ensures protection against uncontrolled movements.
In the future, further safety functions to EN 954-1, EN 13849-1, EN 62061, EN 61800-5-2 and EC 61508 such as "Safe speed limitation" and "Safe Shut-down" will be available on request.







Flexibility – without limits

Irrespective of the sector or application in which you are based, you can use ServoOne to solve your motion control requirements in ways that are comprehensive, intelligent and above all future-proof. The ServoOne system is suitable both for all single-axis machines and for complex multi-axis systems.

ServoOne contributes the required flexibility. Its capability to deliver sector-specific requirements such as dynamics, precision, generation of movement profiles or communication to international standards leaves nothing to be desired. Combined with the multiplicity of motor concepts to which it is matched, there are no limits to its use. Highly dynamic servomotors of the latest design, as well as linear or rotating direct drives move every application.

.

Machine tools

- Milling machines
- Drilling machines
- Lathes
- Grinding machines
- Pipe bending machines
- Spark erosion machines
- Measuring machines
- Machining centres
- Flying shears

Woodworking machines

Robots

- Welding robots
- Painting robots

Plastics processing machines

- Injection moulding machines

Printing machines

Packaging machines

- Sleeve wrapping machines
- Metering equipment
- Blister packaging machines
- Boxing machines
- Palletisers

Paper machines

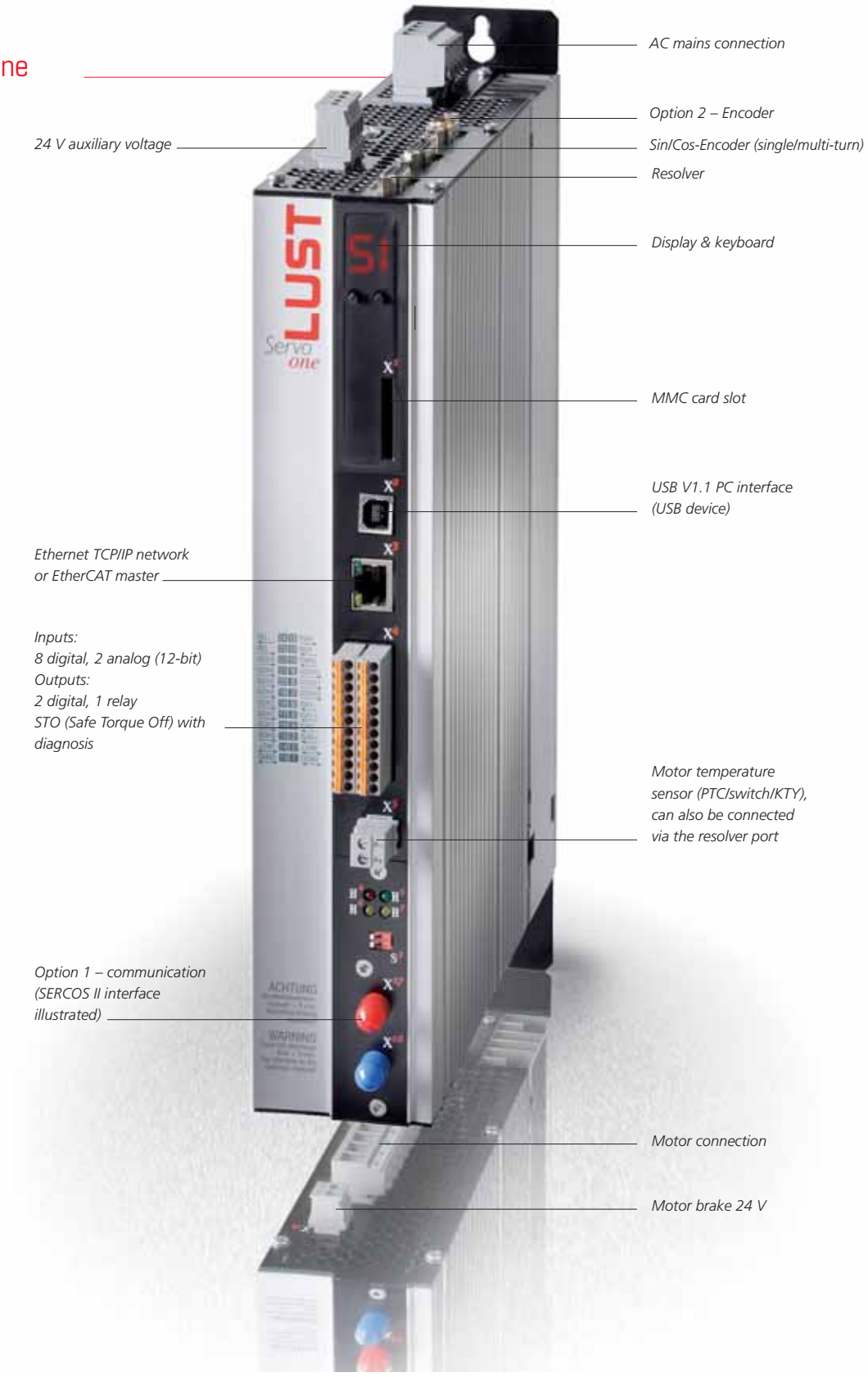
Winding machines

Special machines

You don’t see your sector listed here?

Please let us know ...

ServoOne


AC mains connection
Option 2 – Encoder
24 V auxiliary voltage
Sin/Cos-Encoder (single/multi-turn)
Resolver
Display & keyboard
MMC card slot
USB V1.1 PC interface
(USB device)
Ethernet TCP/IP network
or EtherCAT master
Inputs:
8 digital, 2 analog (12-bit)
Outputs:
2 digital, 1 relay
STO (Safe Torque Off) with
diagnosis
Motor temperature
sensor (PTC/switch/KTY),
can also be connected
via the resolver port
Option 1 – communication
(SERCOS II interface
illustrated)
Motor connection
Motor brake 24 V

BG1 | BG2 | BG3 | BG4 | BG5 | BG6

ServoOne _ drives that set standards

	BG1	BG1	BG2	BG3	BG4	BG5	
Rated voltage	1 x 230 V (-15 % + 10 %)	3 x 230/400/480 V (± 10 %) AC			3 x 400/480 V (± 10 %) AC		
Continuous current effective (I_N) [A_{rms}] at 3 x 400 V	4 (1x230 V)	4/6	8/12	16/20	24/32	45/60/72	90/1
Peak current (10 s) [A_{rms}]	8	8/12	16/24	32/40	48/64	90/120/144	180/2
Approvals	CE, UL						
Dimensions (W x H x D) in mm	58,5 x 355 x 242	58,5 x 355 x 242	90 x 355 x 242	130 x 355 x 242	175 x 355 x 242	190 x 382,5 x 255	280 x (280 x

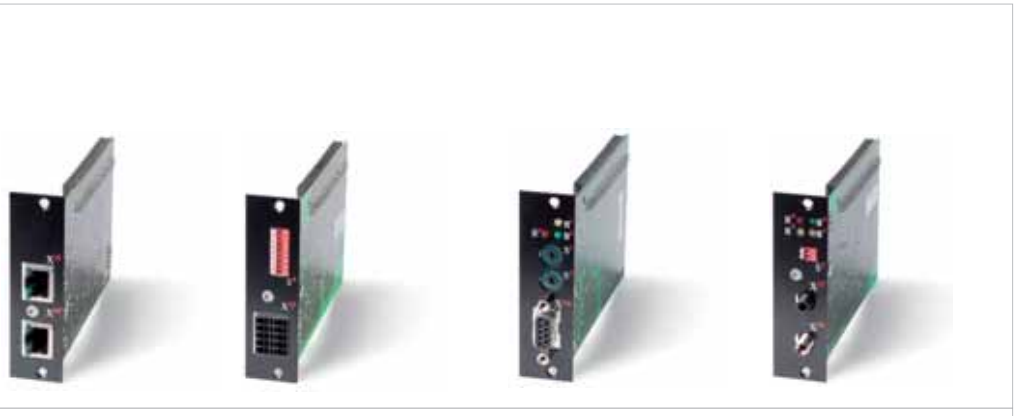
The brake chopper electronics and the mains filter for compliance with EN 61800-3 are incorporated in all controllers up to 72 A.

LST-037 | LSH-050 LST-050 | LSH-074 LST-074 | LSH-097 LST-097 | LSH-127 LST-127 | LST-158 | LST-190

Servomotors _ LSH

	LSH-050	LSH-074	LSH-097	LSH-127	LST-037	LST-050	LST-074	LST-097	LST
Standstill torque [Nm]	0,26-0,95	0,95-4,2	4,1-8,6	11,6-27,0	0,1-0,3	0,20-0,95	0,65-3,0	2,6-9,5	6,6
Rated torque [Nm]	0,24-0,84	0,86-3,1	3,2-6,1	8,4-21	0,09-0,27	0,19-0,85	0,6-2,5	2,3-8,5	5,7
Rated speed [min^{-1}]	4500	3000	3000	3000	6000	4500	3000	3000	3
Installation window [mm]	55	86	98	142	37	55	86	98	14
Design length [mm] [1)]	67-112	96-186	129-189	172-290	81-111	98-158	109-181	146-236	185
Moment of inertia [$kgcm^2$] [1)]	0,06-0,12	0,5-1,5	1,7-3,5	6,8-15,3	0,06-0,08	0,6-0,18	0,5-1,5	1,9-6,1	5,9

[1)] *with resolver, without brake*



System components

Field bus cards (option 1)	Erweiterungs-Karten (Option 2)
CANopen (DS301/DS402)	Interface for 2. sin/cos encoder
PROFIBUS-DP	TTL-encoder simulation
SERCOS II	
SERCOS III	
EtherCAT-Slave	

BG6/6a
0/110(143/170)
30/220 (286/315)
80 x 600 x 240 80 x 600 x 320)

LST-220

Complete system

Direct drives TorqueChampion

Direct drives _ linear

LST-127	LST-158	LST190	LST-220
6,6-22,0	13,5-35,0	27,0-40,0	40,0-115,0
5,7-17,0	13,0-26,0	21,0-26,0	30,0-50,0
3000	3000	3000	3000
142	190	190	240
185-304	201-395	242-287	310-514
5,9-11,7	13,1-46,0	36,0-46,0	76,0-190,0

Information and specifications are subject to change at any time. For more information please visit us at www.lt-i.com.

Direct drives _ linear

Motor type	synchronous
Types	ironless, ironcore
Rated force [N]	30 - 5850
Max. speed [m/s]	10

Different measure length systems admit an optimal adjustment demands of movement.

Direct drives _ rotating

Impulse torque [Nm]	20 – 70
Standstill torque [Nm]	10 – 35 (50)*
Max. speed [rpm]	250 – 500
Hollow shaft [mm]	56
Outside diameter [mm]	145 – 200

**( ) Data for motors with water cooling*

DriveManager _ “Generation 5“

Despite its versatility, the ServoOne from LTi is easy to manage.

The graphical PC-interface incorporates comprehensive online user help and offers automated self-adjustment which significantly reduces the commissioning time.

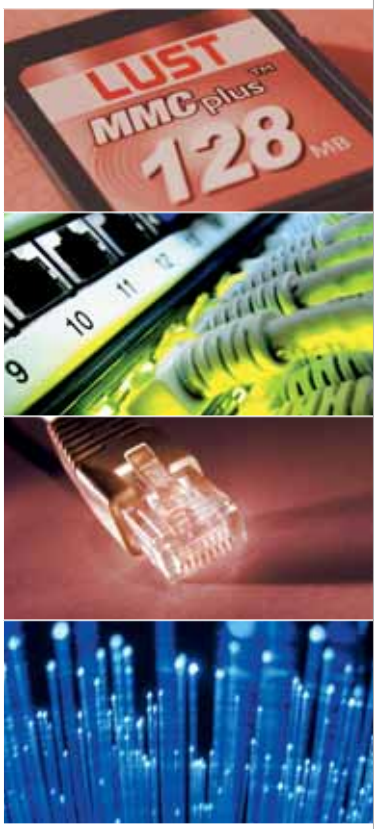
Of course the DriveManager 5 has complete networking capability.

This allows several axis modules to be managed simultaneously within a single project.

The complete application data or the firmware can in addition be saved using a commercially-available MMC memory card.

DriveManager 5 supports you in the following tasks:

- Commissioning, operation and diagnosis
- Project management
- Programming in foreign languages of the IEC 61131 with CoDeSys 3.0



0920.2039-05 10/08

Everything for your success

Drive technology for automation

LTi DRiVES

www.lt-i.com
Servo and inverter drive systems for automation

LEVITEC

www.levitec.de
Motor and magnetic bearing components for high-speed drives

DRESSEL

www.dressel.de
Electrical equipment for plant and machinery

Systems/components in the area of renewable energies

LTi REENERGY

www.lt-i.com
Complete systems in the area of renewable energies

LTi ADATURB

www.adaturb.de
ORC systems of generating power from heat

Micro-system technology/sensor systems

SENSITEC

www.sensitec.com
Magneto-resistive sensor chips and microsystems for measurement of physical variables

LUST HYBRID-TECHNIK

www.lust-hybrid.de
Assembly and interconnection technology for microsystems

LTi DRiVES GmbH
Heinrich-Hertz-Straße 18
59423 Unna
GERMANY
Fon +49 (0) 2303/ 77 9-0
Fax +49 (0) 2303/ 77 9-397
Mail info@lt-i.com
www.lt-i.com

LTi DRiVES GmbH
Gewerbestraße 5-9
35633 Lahnau
GERMANY
Fon +49 (0) 6441/ 96 6-0
Fax +49 (0) 6441/ 96 6-177
Mail info@lt-i.com
www.lt-i.com