

L-force

9400 StateLine Servo Drives



Quick and easy for centralised topologies



Lenze

L-force | your future is what drives us

Demands are increasing all the time. In future, key challenges will lie in the areas of cost efficiency, time-saving and quality improvements. Faster project planning and commissioning, improved performance and increased flexibility in production are expected. New ideas are therefore needed for the machines of the future.

Lenze has risen to this challenge and, with L-force, we can now not only offer you an innovative family of drive and automation products, but also a new, comprehensive portfolio of solutions.

Driven by innovation – New ideas for new possibilities

Always on the lookout: Our idea of innovation is working on even better solutions for our customers, every day.

Driven by flexibility – High degree of scalability for individual solutions

Scalability is an important aspect of the L-force philosophy. Performance, scope of functions, software, service provisions and aftersales care – Lenze will provide you with exactly the combination you require.

Driven by usability – Simple solutions, even for complex applications

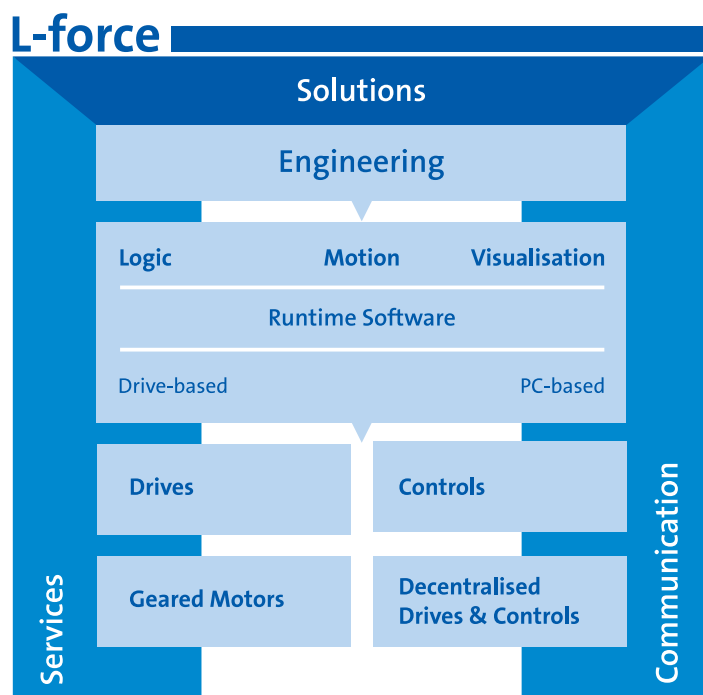
We always focus on the user. Therefore, when we developed L-force, we made sure that people with plenty of practical experience were involved, right from the start.

Driven by compatibility – Universal products and solutions

Don't waste any more time searching for suitable components and the right interfaces. With L-force, everything is compatible.

Our drive – rapid and standardised

9400 StateLine Servo Drives feature the DS402 equipment profile.



9400 StateLine Servo Drives | shows profile

Experience the highlights of the 9400 StateLine Servo Drives – high dynamic performance for centralised topologies, drive-based safety and an innovative installation concept. Profit from the standardised DS402 / IEC 61800-7-2 equipment profile and from rapid setpoint processing in 500 µs. StateLine stands simultaneously for cost-optimised devices which stand out with their rapid and simple set-up – Plug and Play.

DS402 / IEC 61800-7-2 equipment profile

The DS402 / IEC 61800-7-2 equipment profile offers the ability to connect 9400 StateLine Servo Drives via fieldbus communications to higher-level Motion Control units of your choice. The StateLine devices are configured by means of user-friendly dialogues.

Safety simply integrated

Play it safe with the optional safety modules. The pluggable modules meet the requirements of IEC 61508 SIL 3 and are TÜV-tested. This modular approach offers you the security of being able to grow with your requirements.

Innovative – a completely new concept in installation

The 9400 Servo Drives benefit from a revolutionary electromechanical concept: the separation of installation backplane and drive electronics creates previously unknown levels of simplicity in installation, mounting and application.



Central topologies | use DS402

Rapid drive for centralised topologies

Whether Motion Control is implemented in an industrial PC or in a controller – the StateLine is the appropriate drive for your application. Rapid setpoint processing in a 500µs cycle ensures high precision and high dynamic performance in your machine.

Engineering software – L-force Engineer

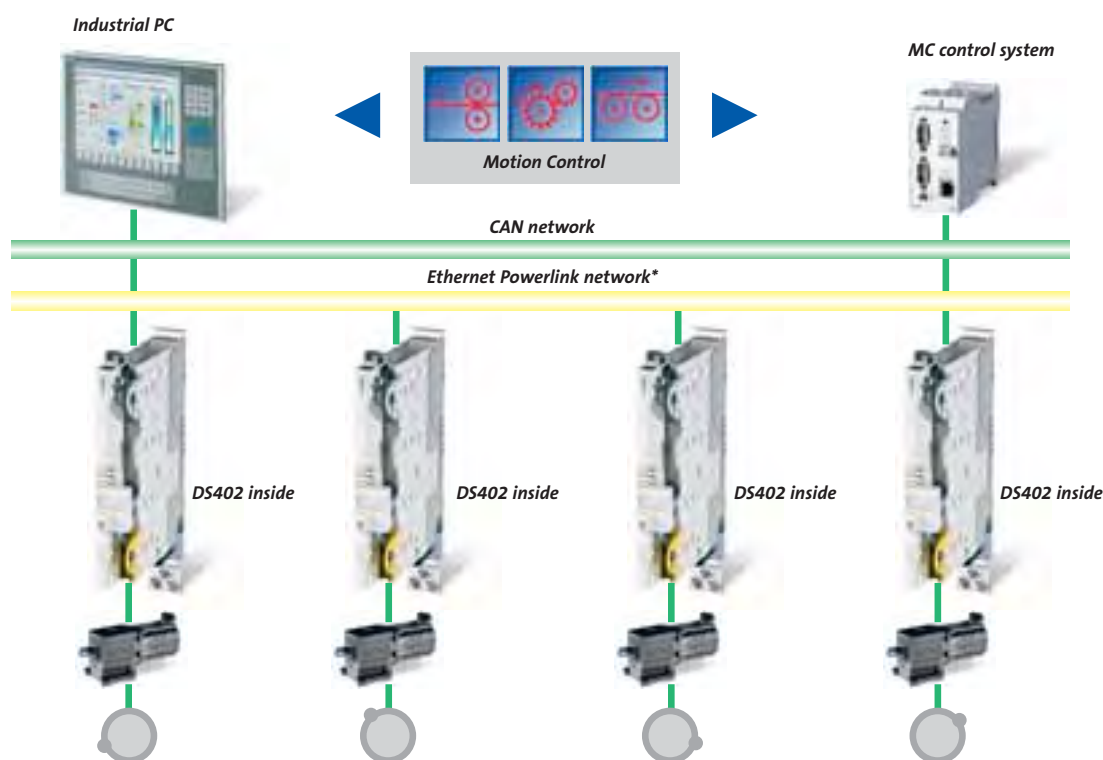
L-force Engineer is the engineering tool for commissioning, configuring and for diagnosis of the 9400 StateLine Servo Drive. The user interface is intuitive and easy to learn. In addition to parameter lists, custom configuration dialogues are available.

Advantages of the 9400 StateLine

- ▶ Servo inverter for centralised topologies
- ▶ Standardised DS402/ IEC 61800-7-2 equipment profile
- ▶ Rapid actuator with a 500 µs cycle time
- ▶ Intelligent interpolation and extrapolation
- ▶ Suitable for multi-axis applications
- ▶ Rapid communications via CANopen / ETHERNET Powerlink*
- ▶ Drive-based safety – scalable



User interfaces in L-force Engineer



* In preparation

Drive technology | that convinces

Single drives

Our single-axis drives combine mains supply, DC bus and inverter in a single unit. The filter elements and brake chopper are integrated into the controller and permit self-sufficient application in distributed control cabinet installations. Single Drives are available in the 0.37 to 370 kW power range.

Multi drives

Our multi-axis drives are particularly suitable for centralised, compact multi-axis installations. The energy exchange via the DC bus reduces the power requirement on the mains side. The axes share use of the mains supply, brake chopper and EMC filter. The materials requirements and installation efforts are thus significantly reduced. The integrated DC busbar system provides for compact installations for drives rated up to 11 kW.

All the data on one module

All equipment settings and application data are stored in a pluggable memory module. This means that, in the event of the hardware being replaced, for instance, it is only necessary to plug the memory module into the new device with a single click and the drive can be used again immediately.



MM110 memory module

StateLine with ...

MM110 memory module

The rapid drive for centralised topologies in machine and system engineering

These drives comply with:
Configurable technology applications
DS402 / IEC 61800-7-2



L-force 9400 StateLine Servo Drives

Communication | and safety

Rapid communication

Thanks to the modularity of the driver, all options for communication with the host Motion Control system are available. Whether today with the CANopen extension module or tomorrow with rapid, ETHERNET-based bus systems such as ETHERNET Powerlink or EtherCAT – the 9400 StateLine Servo Drive will be supplied quickly with setpoint values and your dynamic drive solution will be ensured.

Communication modules

- ▶ **CANopen** extension module
- ▶ **ETHERNET Powerlink*** extension module



Extension module
CANopen



Extension module
ETHERNET Powerlink*

Safety integrated into the drive

Safe, scaled, and above all integrated. The safety functions themselves are built into the drive on separate modules. They are designed to be pluggable. A scaled range of safety modules is available – tailor-made scalability. The requirements of your application are fixed, we have the appropriate module. Modularity offers openness to further developments and hence a high degree of future-proofing.



SM□□□ safety modules

- ▶ **SM0**
no safety function/required for the operation of the drive controller
- ▶ **SM100**
Safe Torque Off (STO) safety function
- ▶ **SM301**
extended safety functions including:
Safe Torque Off (STO), Safe Stop 1 & 2 (SS1 & SS2),
Safely Limited Speed (SLS), Operation Mode Selector
with confirm (OMS & ES) safe two-channel inputs/output,
further ...



SM301

* In preparation

Technical data | 9400 StateLine Servo Drives

Overview – performance features

Basic functions	e.g. homing mode, interpolated position mode, cyclic synchronous velocity mode, cyclic synchronous torque mode, electronic nameplate	✓
Interfaces	Analogue inputs/outputs	1/0
	Digital inputs/outputs	4/1
	Resolver input	✓
	Multiple encoder interface for one of the following feedback systems: – TTL incremental encoder – SinCos incremental encoder – SinCos absolute value encoder with Hiperface® interface – SinCos absolute value encoder with Endat V2.1 interface	✓
Extension modules	Number of slots	1
	CANopen, ETHERNET Powerlink*	○
Memory modules – Functional range	MM110 – DS402 Motion Control StateLevel	●
Safety modules	SM0 – no safety functions	●
	SM100 – Safe Torque Off, EN954-1 cat. 4	○
	SM301 – Extended safety functions, including Safe Torque Off, Safe Stop 1 & 2, Safely Limited Speed, Operation Mode Selector with confirm, safe inputs/outputs, EN954-1 cat. 3	○
Motor brake modules	DC 24 V – 2.5 A, may be integrated into installation backplane up to 11 kW	○
	24 V DC – 5 A, may be integrated into drive from 15 kW	○
	205 V DC – 0.75 A, may be integrated into drive from 15 kW	○

- ✓ Included
- Standard
- Option
- * In preparation

Axis modules

Mains voltage range	3/PE AC 180 V -0 % ... 550 V +0 %; 45 Hz -0 % ... 65 Hz +0 %		3/PE AC 342 V -0 % ... 550 V +0 %; 48 Hz -0 % ... 65 Hz +0 %	
Version	Single Drive			
	Multi drive			
DC rated output current [A]	1.5 ... 23.5	32 ... 104	145 ... 695	
DC max. short-term Output current [A]	6 ... 58.5	64 ... 208	261 ... 1251	
Typical motor power [kW]	0.37 ... 11	15.5 ... 55	75 ... 370	
Electronics supply	internal; alternatively DC 24 V external			
Brake chopper	Integrated			
Brake resistor	External			

Supply modules

Mains voltage range	3/PE AC 180 V -0 % ... 550 V +0 %; 45 Hz -0 % ... 65 Hz	
DC rated output current [A]	10 ... 245	
DC max. short-term Output current [A]	40 ... 368	
Rated mains current [A]	8 ... 200	
Electronics supply	internal; alternatively DC 24 V external	
Brake chopper	Integrated	
Brake resistor	External	