

**Safe, scaleable
and above all
integrated.**

1

Developing ideas

Are you looking to build the best conveyor possible and already have some initial ideas? Then get these down on paper together with us, starting with small innovative details and stretching all the way to completely new machines for conveyor systems. Working together, we will develop an intelligent and sustainable concept that is perfectly aligned with your specific requirements.

2

Drafting concepts

We see welcome challenges in your tasks, supporting you with our comprehensive expertise and providing valuable impetus for your innovations. We take a holistic view of the individual motion and control functions here and draw up consistent, end-to-end drive and automation solutions for you – keeping everything as easy as possible and as extensive as necessary.

Lenze makes many things easy for you.

With our motivated and committed approach, we work together with you to create the best possible solution and set your ideas in motion – whether you want to optimise an existing system or develop a new machine for a conveyor system. We always strive to make things easy while seeking perfection. This is anchored in our thinking, in our services and in every detail of our products. It's as easy as that!

3

Implementing solutions

Our easy formula for satisfied customers is to establish an active partnership with fast decision-making processes and an individually tailored offer. We have been using this simple principle to meet the ever more specialised customer requirements in the field of mechanical engineering for many years.

4

Manufacturing machines

Functional diversity in perfect harmony: as one of the few full-range providers in the market, we can provide you with precisely those products that you actually need for any conveyor task – no more and no less. Our L-force product portfolio, a consistent platform for implementing drive and automation tasks, is invaluable in this regard.

5

Ensuring productivity

Productivity, reliability and new performance peaks on a daily basis – these are our key success factors for your conveyor. After delivery, we offer you cleverly devised service concepts to ensure continued safe operation. The primary focus here is on technical support, based on the excellent application expertise of our highly skilled and knowledgeable after-sales team.

**Integrated
safety –
easy.**

Here at Lenze, we use our drive-based and controller-based safety concept to focus on the area of safety engineering. The moving parts of machines create hazards for operating and maintenance personnel, so the task is to protect staff members from these hazards at all times – and the most effective way to do this is to take action at the point in the machine where the hazardous movement originates: directly in the controller itself.

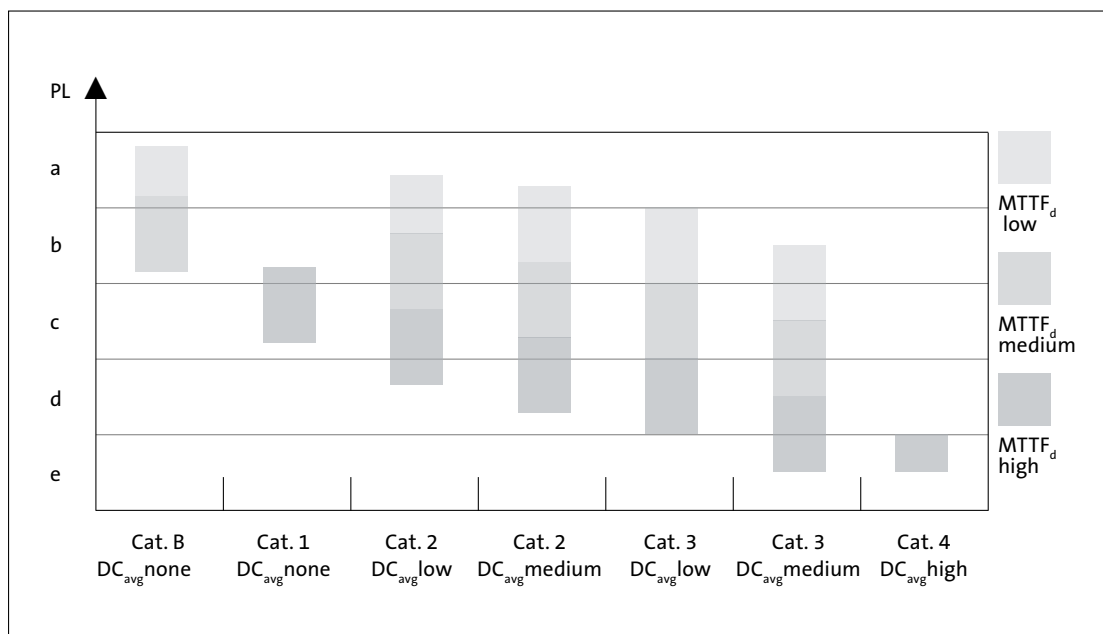
Safe, scaleable and above all integrated

The safety functions are integrated into the drive and implemented on separate, pluggable modules.

A range of graded safety modules are available to ensure tailor-made scalability. Since the customer-specific requirements of the application are paramount, we offer exactly the right modules to accommodate them each time. This modular concept also leaves room for subsequent developments, and creates systems that are fit for the future.

Certified in accordance with EN ISO 13849-1

As the safety functions integrated into the drive already come with certification, this makes the certification process for the entire machine (by the German TÜV testing authority or the Employer's Liability Insurance Association, for example) much easier. The safety modules are certified in accordance with EN ISO 13849-1 and achieve the maximum performance level, PL e.



Relationship between category, DCavg, MTTFd and PL in accordance with EN ISO 13849-1

How you
benefit from
our safety
engineering.

All the benefits at a glance

Take advantage of our expertise and our components to implement safety engineering in your machines simply yet comprehensively.

- Lower system costs
 - Reduction in space requirement
 - Reduction in wiring complexity
 - No external safety engineering hardware required
- Simplification of the system structure
 - Reduction in wiring complexity
 - Greater transparency
- Easy-to-understand complexity
 - All functions are drive-related and are available for the Controller via FSoE
 - Greater transparency
- Enhanced system performance
 - Shorter switch-off times due to the absence of contactors
 - Shorter reactivation times because the DC bus remains charged



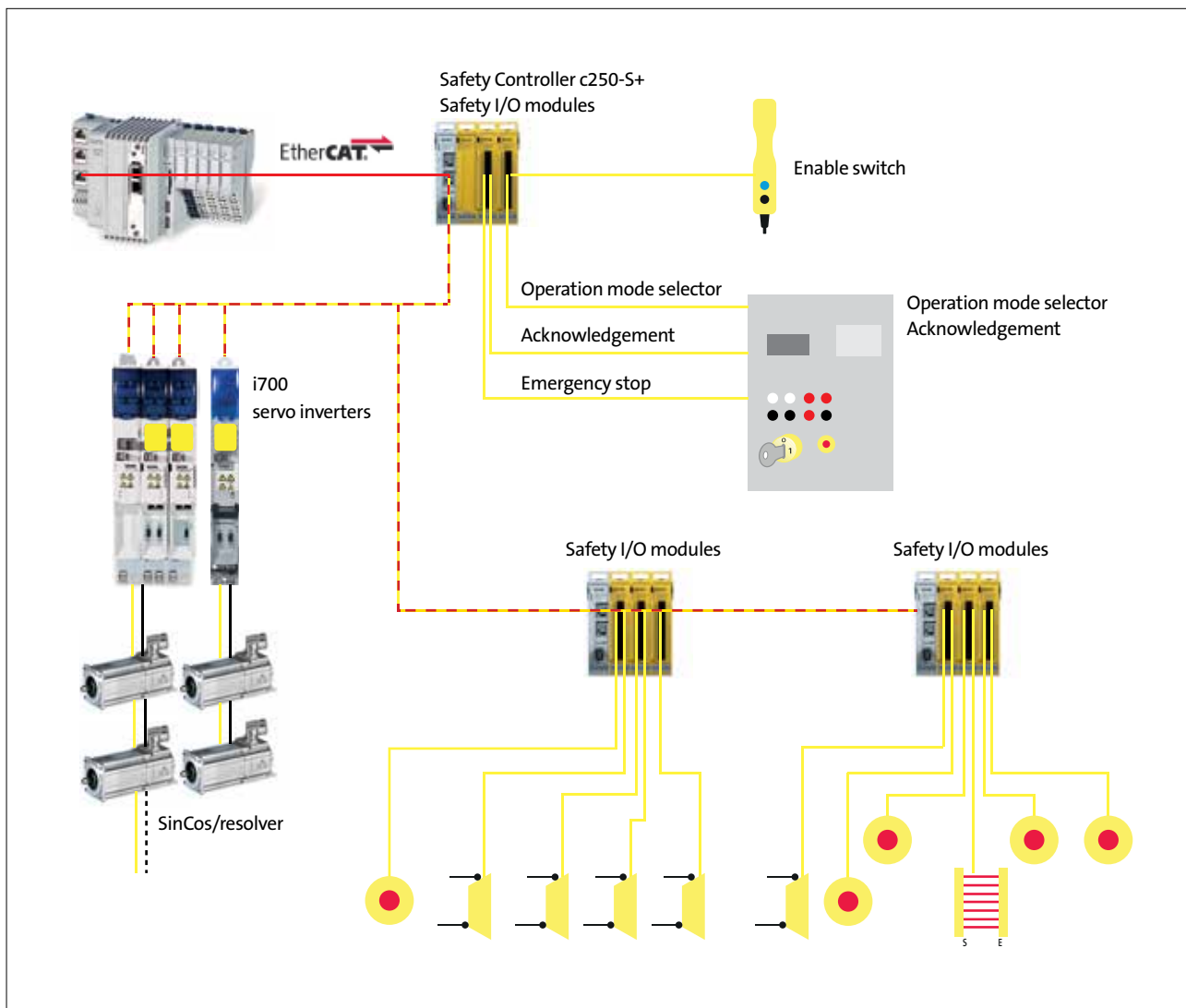
Integration
into your
safety
concept.

Direct connection

Safe, two-channel inputs are provided for the safety sensor technology to integrate drive-based and/or controller-based safety into your machine's safety chain. A higher-level PLC that processes both standard and safety logic is connected to bus systems that can simultaneously transfer safe and non-safe data on a physical bus system, such as PROFIsafe or FsoE.

From planning right through to certification

When it comes to implementing your safety requirements, we provide you with support in the form of optional safety engineering. All the functions have been developed in accordance with IEC 61508, SIL 3, and meet the requirements of EN ISO 13849-1 PL e and EN 62061 SIL 3. This makes it easier to get certification for your entire machine.



Functional overview.

			Inverters				Servo inverter		Controllers
			i550	8400	8400 motec	8400 protec	i700	9400	c250-S
Safe stop and brake functions	STO	Safe torque off	●	●	●	●	●	●	○
	SS1	Safe stop 1				●		●	○
	SS2	Safe stop 2**						●	○
	SOS	Safe operational stop**						●	○
Safe motion basic functions	SLS	Safely limited speed**						●	○
	SS1	Safe stop 1				●		●	○
	SS2	Safe stop 2**						●	○
	SLP	Safely limited position**						●	○
Safe motion advance functions	SCA	Safe cam**						●	○
	SSM	Safe speed monitoring**						●	○
	SDI	Safe direction**						●	○
	SLI	Safely limited increment**						●	○
More safe functions	SSE	Emergency stop				●		●	○
	OMS	Operating mode selector switch with enable switch (ES)				●		●	○
	SMS	Safe maximum speed**						●	○
		Safe monitor						●	○
	SCAS	Cascading of the STO safety function						●	○
	PDSS	Position-dependent safely limited speed**						●	○
		PLC open TC 5 functions							●
Safety communication		Safety bus PROFIsafe				●		●	
		Safety bus FSoE						●	●
		Secure transfer of current position and speed data**						●	●
		Connecting safety sensors	●	●	●	●	●	●	●
		Operation with safety PLC				●		●	

● Safety function integrated

○ Control of the safety function

Lenze motor combinations for Servo inverter 9400 with safety module SM301 or SM302

In the table above, some of the functions are marked with **. These functions can be used with the following drives:

Synchronous servo motors (MCS, MDxKS)	Max. achievable PL/SIL up to	Asynchronous motors (MCA, MQA*)	Max. achievable PL/SIL up to	Three-phase AC motors (MD, MH, MF, m550-P)	Max. achievable PL/SIL up to
AS1024-8V-K2	PL d/SIL 2	IG1024-5V-V3	PL e/SIL 3	IG2048-5V-V2	PL d/SIL 2
AM1024-8V-K2	PL d/SIL 2	RV03 (resolver)	PL e/SIL 3	IG2048-5V-V3	PL e/SIL 3
RV03 (resolver)	PL e/SIL 3	2-encoder concept	PL e/SIL 3	2-encoder concept	PL e/SIL 3
2-encoder concept	PL e/SIL 3				

A "2-encoder concept" is a resolver as a motor feedback unit and, at the same time, an absolute value encoder (SinCos), an incremental encoder (TTL), an SSI encoder or bus encoder as position encoder at the machine.

*MQA and MCA 20, 22 and 26 only as brake motors, not with safety resolver RV03

Safety certified
by the German
TÜV testing
authority.

Lenze products with functional safety are developed in compliance with the latest standards and guidelines, and we take pride in the verification of our products by means of regular certification from TÜV Rheinland. We provide you with the safety-relevant parameters in an easy-to-use SISTEMA VDMA 66413 library “Functional Safety - Universal Database for safety-related values of components or parts of control systems” for your further use. SISTEMA – an IFA tool that is used to determine the PL achieved in different applications.



We are keen to help get your ideas moving forward! Learn more about our approach, our ways of thinking, our vision and how we can make things easier for you in future. Please feel free to contact us directly or visit us at:

**www.
Lenze.
com**

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