

Välkommen till Siemens webinarium!

Klockan 10.00 börjar sändningen

23 April 2021 • Sinamics S210 – nya motortyper, växlar och TIA Selection Tool

Presentatör Dag Bauer



SINAMICS S210 Servo Drive System, positioning within SINAMICS “Discontinuous Motion” Portfolio

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Basic: SINAMICS V90 Servo Drive System

Single axis AC/AC drive with **basic functionality** and connectivity for standard numeric and motion controllers



Midrange: SINAMICS S210 Servo Drive System

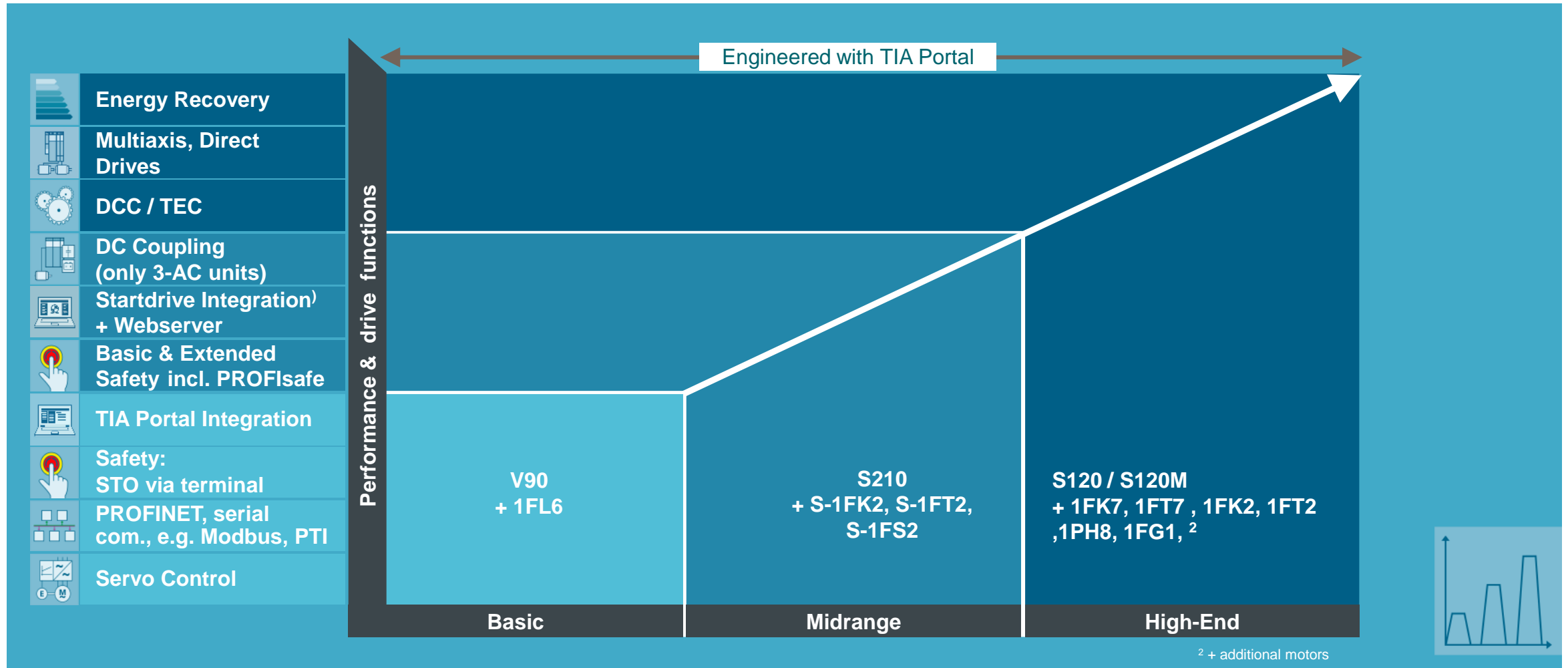
Single axis AC/AC drive with **high dynamic and performance** for motion applications in the mid range segment.



High-End: SINAMICS S120 Servo Drive

Modular DC/AC multi axis system with **most advanced drive based technology** and connectivity to high end numeric and motion controllers

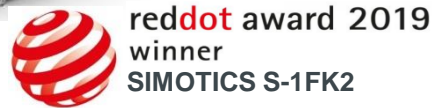
The scalable SINAMICS Drives Portfolio for „Discontinuous Motion“



SINAMICS S210 Servo Drive System

The top highlights of the System

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Feature / Function

- SIMOTICS S-1FK2 Motor & Planetary Gearbox, S-1FT2, S-1FS2
- Fast Current Controller (62,5 μ s)
- Fast PROFINET IRT (250 μ s)
- DC-Coupling (for 3-AC units)

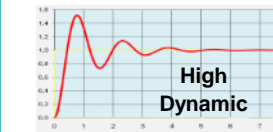
- Basic & Extend. Safety integrated functions viaPROFIsafe

- Integrated Webserver
- "One Button Tuning"
- TIA Portal (V15.1) integrated
- TIA Selection Tool integrated

- One-Cable-Connection (OCC)
- Integrated EMC Filter
- Integrated Braking Resistor

- 1AC 230V (200-240V) 0.05 – 0.75kW
- 3AC 400V (200-480V) 0.4 – 7kW
- UL Certification
- S-1FS2 in Stainless Steel for F&B/Pharma

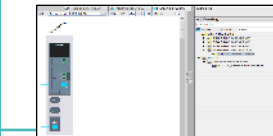
Benefits



- Increase performance



- Fulfill high demands for safety



- Easy engineering



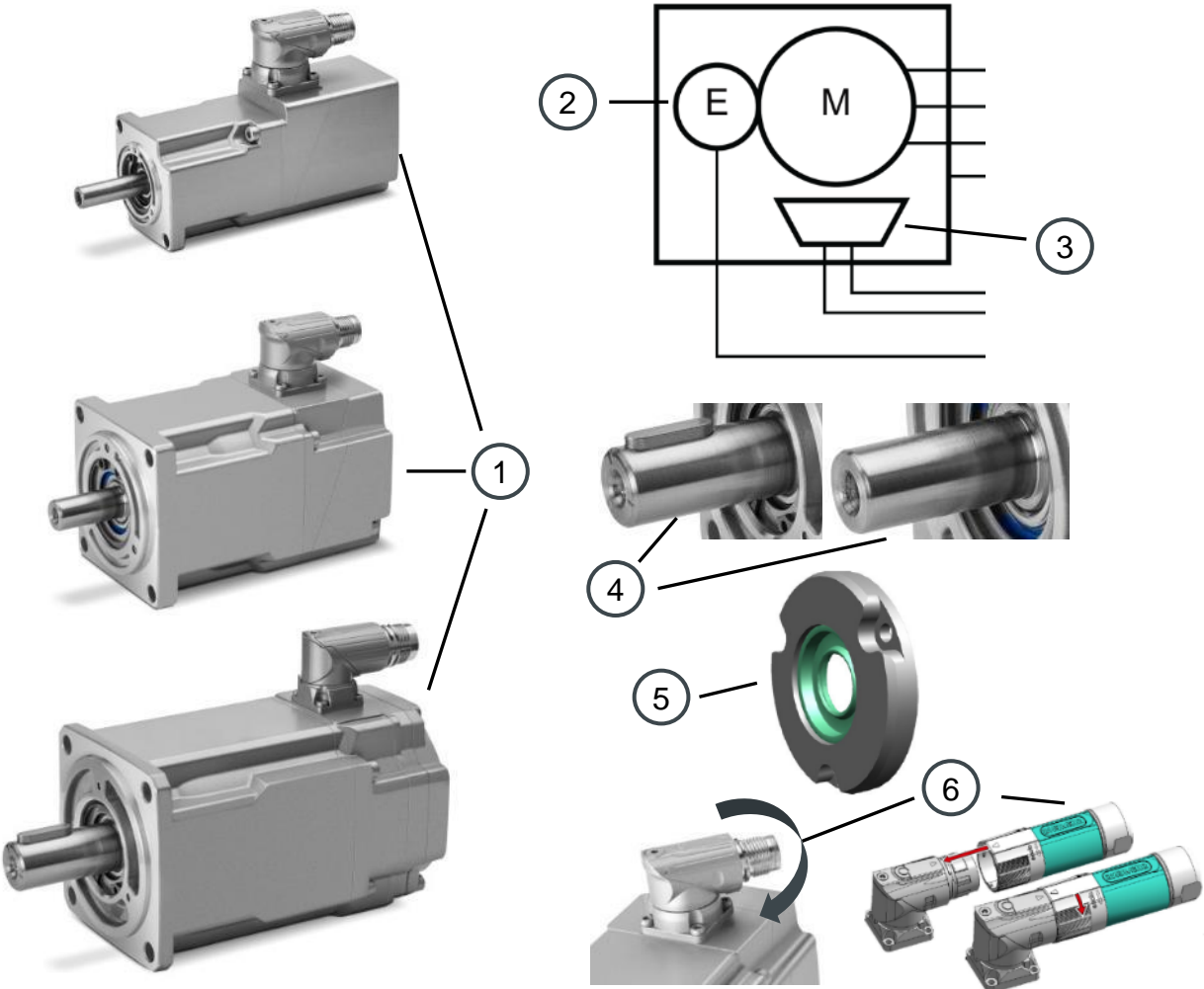
- Saves time on installation



- Ready for world wide markets

SIMOTICS S-1FK2

Overview



Overview SIMOTICS S-1FK2

Different rotor inertia classes and motor sizes

High Dynamik (HD):
for high acceleration and dynamic.

SH	Stall torque	n _{rated}
SH20	0,16 – 0,32 Nm	3000 rpm
SH30	0,64 – 1,27 Nm	3000 rpm
SH40	1,27 – 3,2 Nm	3000 rpm
SH52	5 – 8 Nm	3000 rpm
SH63	12 – 16 Nm	3000 rpm

Compact (CT):
For medium load inertia.

AH	Stall torque	n _{rated}
SH30	0,64 – 1,27 Nm	3000 rpm
SH40	2,4 – 3,2 Nm	3000 rpm
SH48	3,5 – 6 Nm	3000 rpm
SH63	6 – 12 Nm	3000 rpm
SH80	16 – 27 Nm	2000 rpm
SH100	30 – 40 Nm	2000 rpm

2 Encoder options available:

- Resolution: 22 Bit absolute singleturn
- Resolution: 22 Bit absolute + 12Bit multiturn (=4096 revolutions)

3 With or without holding brake

4 Shaft: plain or feather key; different diameter available for SH 30

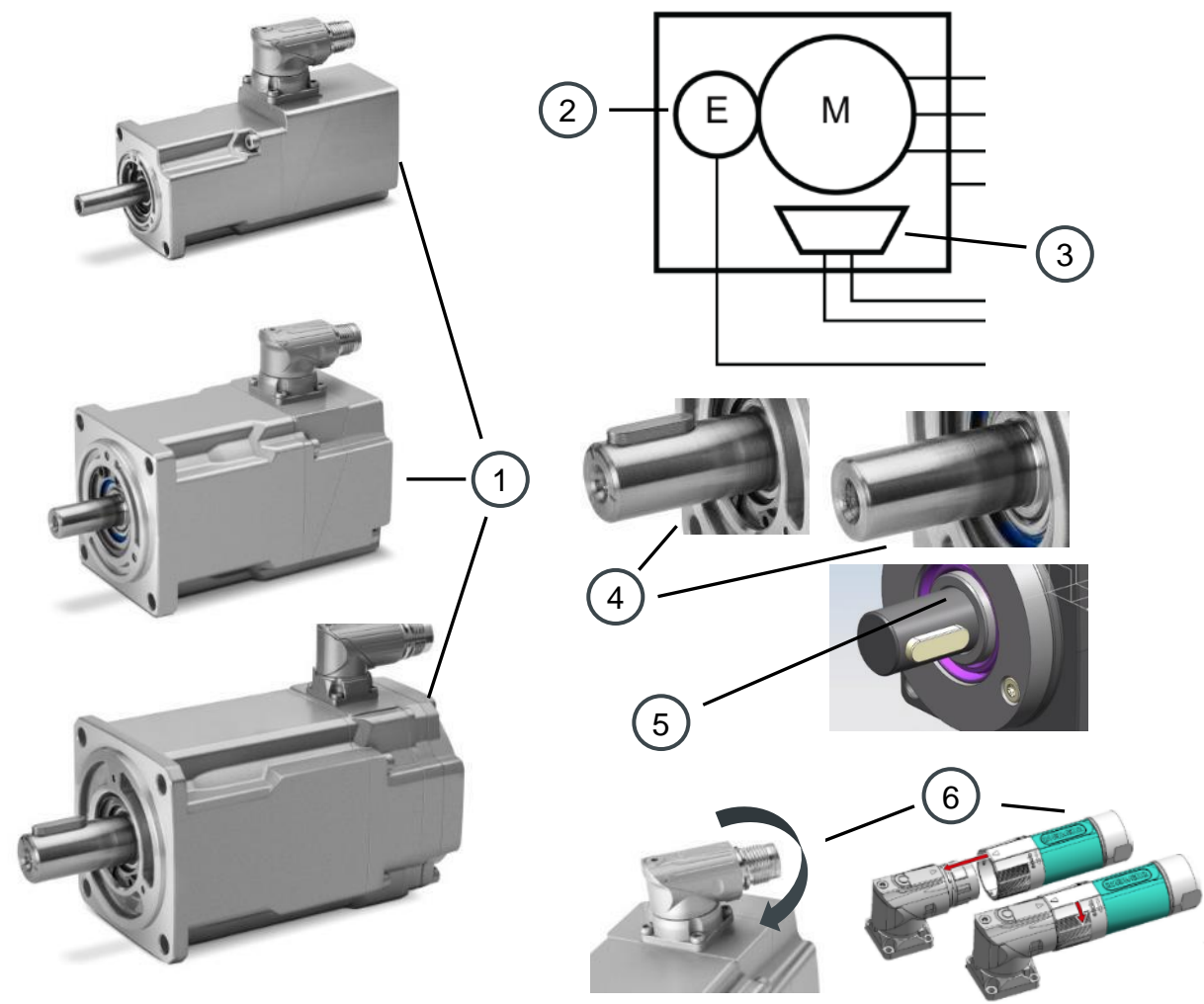
5 Optional sealing ring: Protection degree IP65 at shaft. (S-1FK2 standard: IP64)

Only one plug: Turnable, fast connection and small size:

- SH20, 30: M12
- SH40, 48, 52: M17
- SH63, 80, 100: M23

SIMOTICS S-1FT2

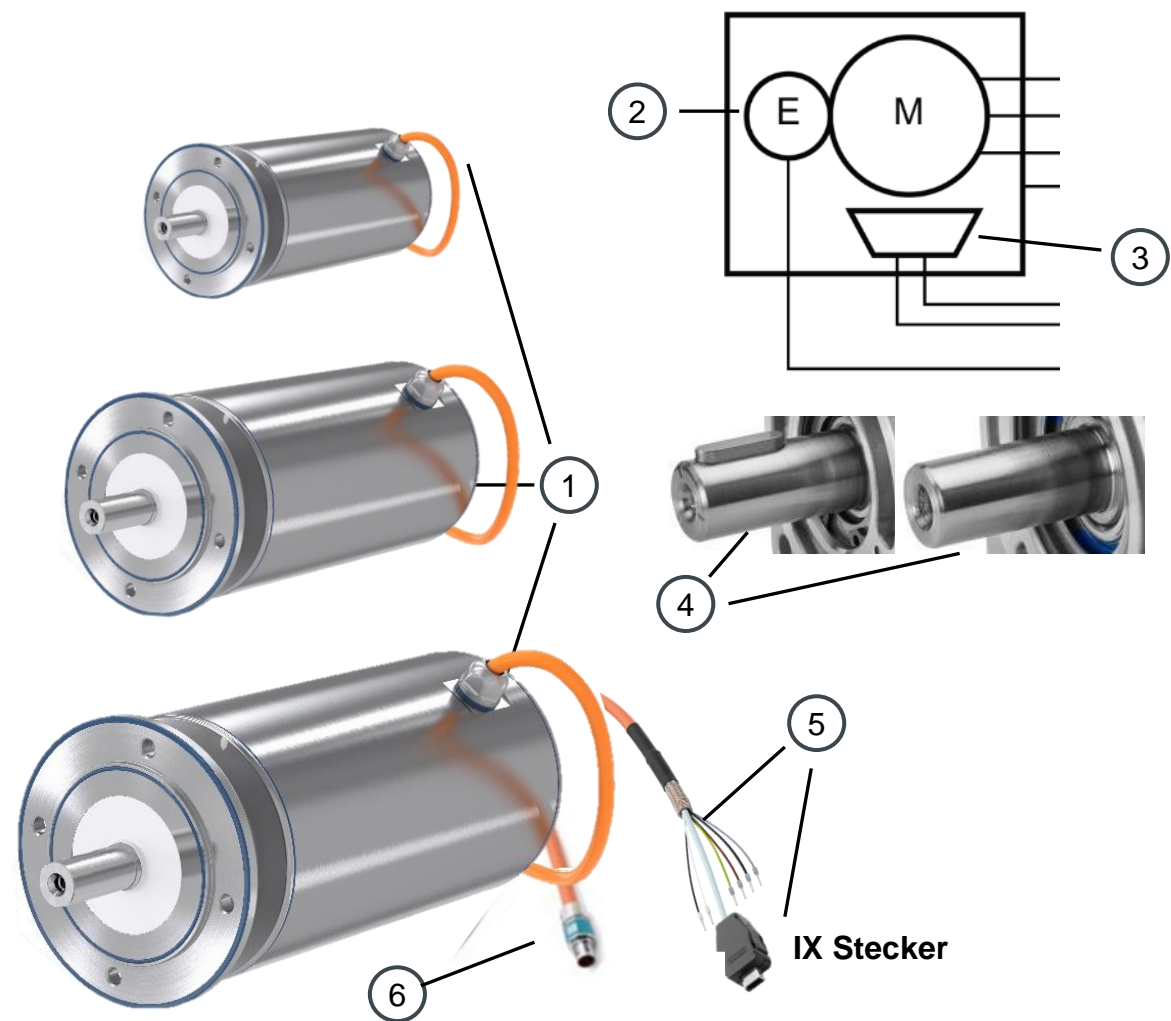
Overview



Overview SIMOTICS S-1FT2					
Different rotor inertias and shaft heights					
1	High Dynamik (HD): for high acceleration and dynamic			Compact (CT): For medium load inertia.	
	SH	Stall torque	n _{rated}	AH	Stall torque n _{rated}
	SH20	0,16 – 0,32 Nm	3000 rpm	SH30	0,64 – 1,27 Nm 3000 rpm
	SH30	0,64 – 1,27 Nm	3000 rpm	SH40	2,4 – 3,2 Nm 3000 rpm
	SH40	1,27 – 3,2 Nm	3000 rpm	SH48	3,5 – 6 Nm 3000 rpm
	SH52	5 – 8 Nm	4500 rpm	SH63	6 – 12 Nm 4500 rpm
	SH63	12 – 16 Nm	3000 rpm	SH80	16 – 27 Nm 3000 rpm
				SH100	30 – 40 Nm 2000 rpm
2	4 Encoder types available: <ul style="list-style-type: none"> Resolution: 22 Bit absolute Singleturn and 22 Bit absolute + 12Bit Multiturn Resolution: 26 Bit absolute Singleturn and 26 Bit absolute + 12Bit Multiturn (in preparation) 				
3	With or without holding brake				
4	Shaft: plain or feather key; different diameter available for SH 30				
5	Optional Protection degree class IP65 or IP67 (standard is IP64)				
6	Only one plug: Turnable, fast connection and small size				
	Other options: Metal rating plate, pressure equalization port, increased chemical resistance, various color options. Customized versions possible!				

SIMOTICS S-1FS2

Overview



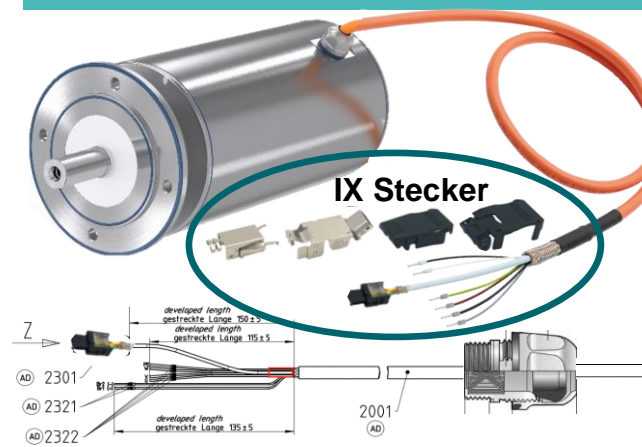
Overview SIMOTICS S-1FS2			
	Diferent Shaft hights	Stall torque	n _{rated}
1	SH40	3Nm	6000 rpm
	SH52	8Nm	6000 rpm
	SH63	14Nm	6000 rpm
	SH80	23Nm	6000 rpm
2	Encoder: Resolution: 22 Bit absolute + 12Bit multiturn (=4096 revolutions)		
3	With or without holding brake		
4	Shaft: plain or feather key;		
5	<ul style="list-style-type: none"> Cable pre-assembled on motor and cable can be ordered in 0.5m steps up to 11m IX connector partially assembled (shield plate and connector housing included so that the cable can be routed more easily through e.g. cable gland into the control cabinet. 		
6	<ul style="list-style-type: none"> Cable pre-assembled on motor and cable can be ordered in 0.5m increments up to 11m Cable end with mounted connector, extension of motor cable possible with full Motion Connect product range (connector in protection class IP67) 		

Stainless steel servo motor 1FS2

2 Variants of connection types

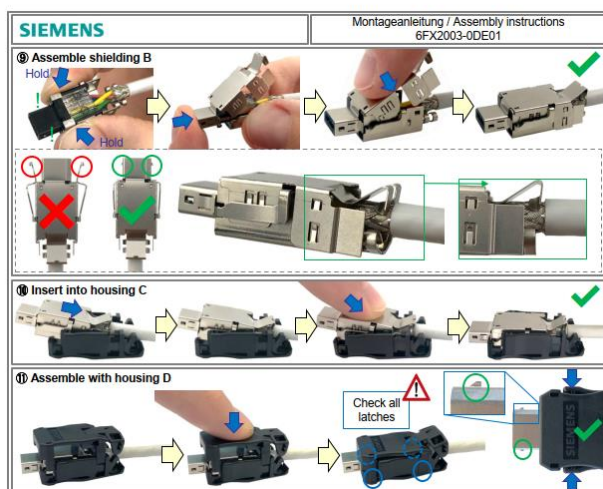
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Example: 1FS2104-6AF07-0MZ0 Q0B



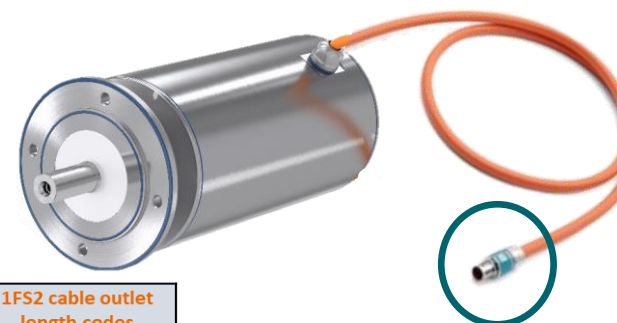
Q0 → loose cable end

- IX Encoder Connector preassembled, shielding and plastic cover has to snap on (included in delivery). This allows a better access through hygienic cabinet cable glands.
- Easy assembly when cable is in cabinet
- The required cable length can be selected (**last digit of the Ordernumber**) (maximum length is 11m). If longer cable lengths (>11m) are required, please use the motor version Q1.



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Example: 1FS2104-6AF07-0MZ0 Q1B



Q1 → cable end with connector

- Drive end of motor equipped with connector, motor cable must be extended with motor- or extension cable out of the One Cable Connection portfolio, like the MOTION-CONNECT 800 trailing cable.
- Motion Connect connectors are in IP67
- Maximum allowed cable lengths between motor and drive is 50m

1FS2 cable outlet length codes	
Q0 / Q1	
Code	length /m
A	0,5
B	1
C	1,5
D	2
E	2,5
F	3
G	3,5
H	4
J	4,5
K	5
L	5,5
M	6
N	6,5
P	7
Q	7,5
R	8
S	8,5
T	9
U	9,5
V	10
W	10,5
X	11

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Planetary gearboxes for SIMOTICS S-1FK2:

→ based on the three eco-gearbox lines from Neugart

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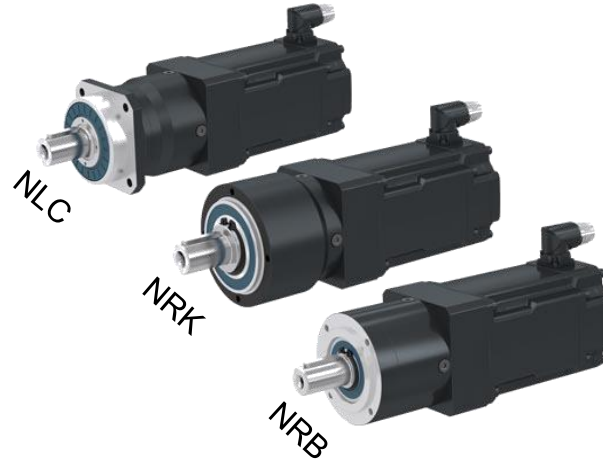


Three Gearbox lines for SIMOTICS S-1FK2 (@S210 & S120)



All 3 types are „ECO Gearboxes“

- Straight toothed
- Medium backlash
- Grease lubrication



Availability:

Geared motor is only available as a unit
Motor + Gear (no single gears)

Ordering:

Ordering:

Motor MLFB

1FK2104-4AF00-0MA0-Z A21 + R03 + M00

Gearbox size and stages

Gearbox ratio

Options (key, special lubrication)

Purpose:

- Adjustment of speed and torque
- Adjustment of inertia ratio (load / motor)
- Enable more dynamic solution compared to direct drive

Fields of application:

- Handling / Logistics
 - Packaging
 - Food and beverages
 - Textile
 - Wood, glass, ceramics
- all with focus on economic solution for dynamic and power density

Advantages:

- Dimensioning, ordering, documentation all within the Siemens ecosystem
- Less effort for gearbox mounting at customer side
- Complete system responsibility Siemens

Selection:

- Via TIA Selection Tool or DT-Configurator

Planetary gearboxes for SIMOTICS S-1FK2: → Technical data

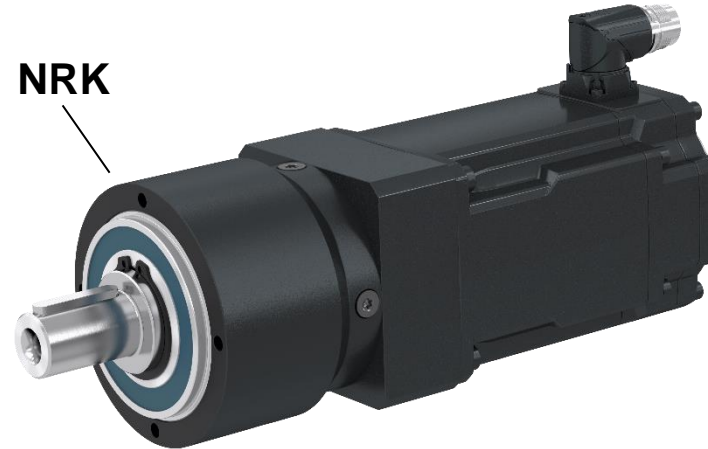
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<u>Gearbox</u>	<u>for motor</u>	<u>M_{2N} (gear)</u>
NRB040	SH20 – 30	5 – 20 Nm
NRB060	SH20 – 52	15 – 44 Nm
NRB080	SH30 – 63	38 – 120 Nm
NRB120	SH30 – 80	95 – 260 Nm
NRB160	SH40 – 80	400 – 800 Nm

Gearbox ratio each

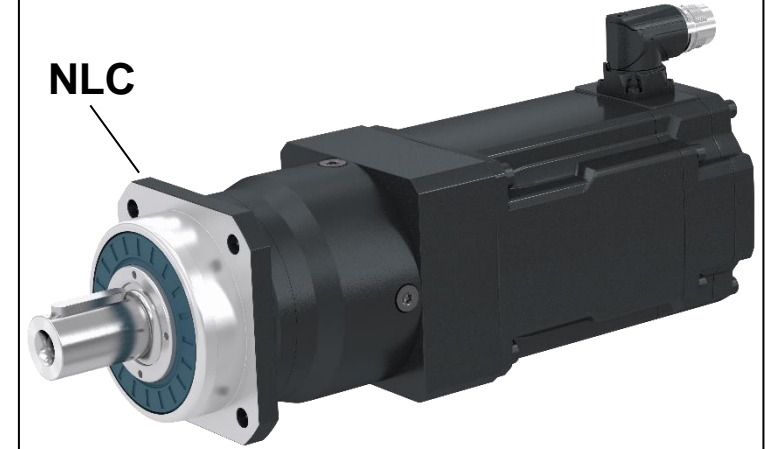
1 stage: $i = 3 - 10$
 2 stage: $i = 9 - 64$
 3 stage: $i = 60 - 512$



<u>Gearbox</u>	<u>for motor</u>	<u>M_{2N} (gear)</u>
NLK050	SH20 – 30	5 – 15 Nm
NLK070	SH20 – 52	15 – 38 Nm
NLK090	SH30 – 63	38 – 90 Nm
NLK120	SH30 – 80	95 – 195 Nm
NLK155	SH40 – 100	210 – 460 Nm

Gearbox ratio each

1 stage: $i = 3 - 10$
 2 stage: $i = 9 - 100$



<u>Gearbox</u>	<u>for motor</u>	<u>M_{2N} (gear)</u>
NLC060	SH20 – 52	15 – 44 Nm
NLC080	SH30 – 63	38 – 120 Nm
NLC120	SH30 – 80	95 – 260 Nm

Gearbox ratios each

1 stage: $i = 3 - 10$
 2 stage: $i = 9 - 100$

Planetary gearboxes for SIMOTICS S-1FK2:

→ The three gearbox lines

Same gearbox core for NRB, NRK and NLC

- straight toothing
- medium backlash
- grease lubrication

Gerbox Size

Backlash

(1-stage)
[arcmin]

N□□ 040 / 050	15
N□□ 060 / 070	10
N□□ 080 / 090	7
N□□ 120	7
N□□ 155 / 160	6-8

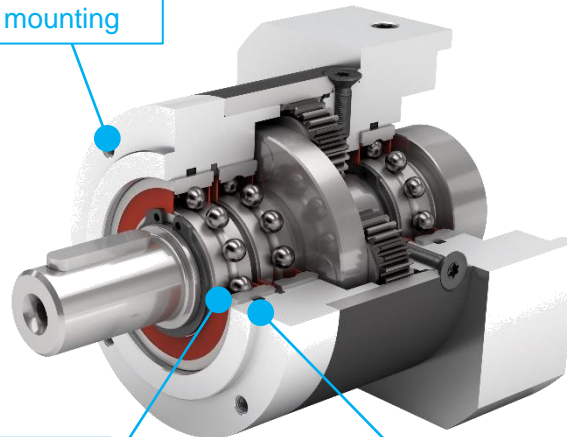
Gearbox efficiency

1 stage:	97 – 98 %
2 stage:	96 – 97 %
3 stage:	92 %

NRB



IM B14
mounting



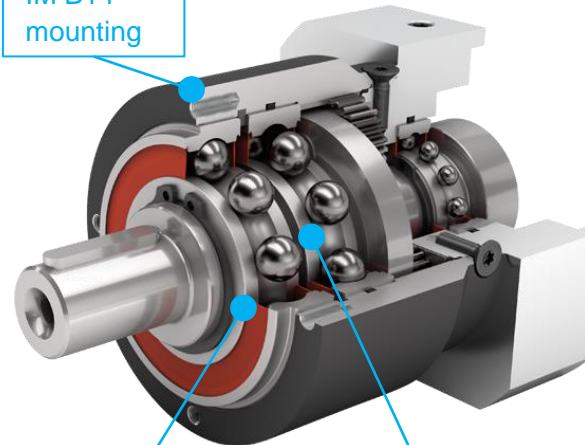
IP64

High input speed due to low-friction bearing design

NRK



IM B14
mounting



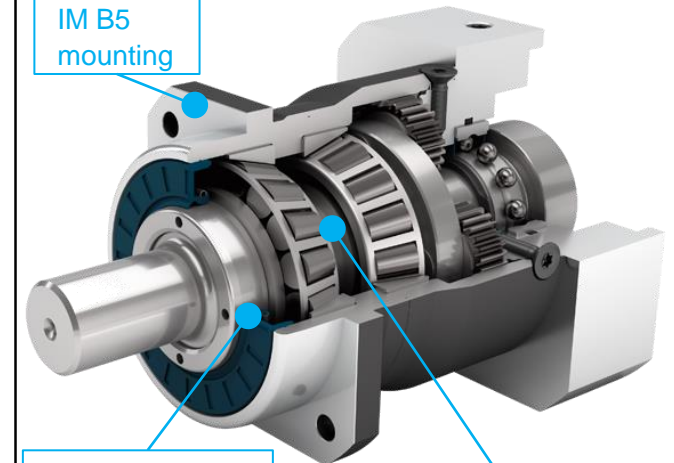
IP64

Large ball bearing optimized for high radial and axial forces

NLC



IM B5
mounting



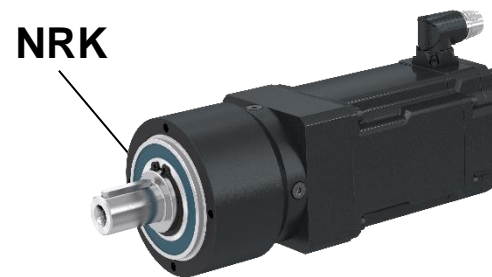
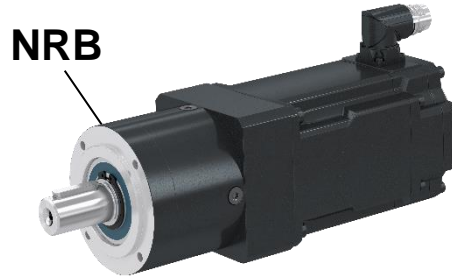
Perfect protection against dust and water with IP65 seal

Prestressed tapered roller bearings for best stiffness under highest loads.

Planetary gearboxes for SIMOTICS S-1FK2 :

→ The three gearbox lines

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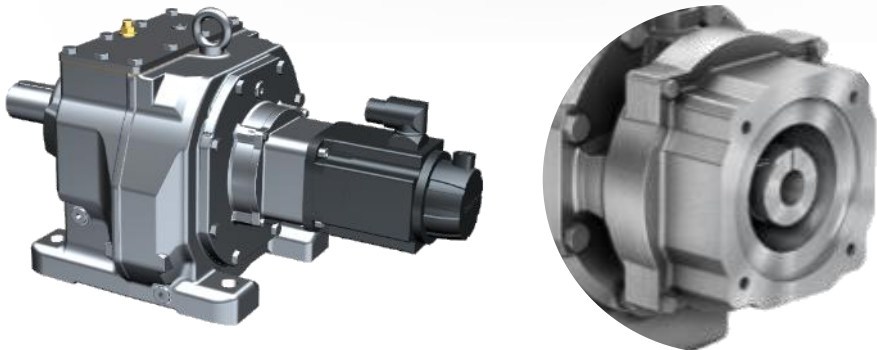
	The NRB is the lightest gearbox with the highest power density. Thanks to its low-friction bearing design, it is suitable for high speeds and generates only low heating.	The gearboxes of the NRK series are suitable for higher radial and axial forces due to the large output bearing. This gearbox is also suitable for higher speeds thanks to low internal friction.	Thanks to the preloaded taper roller bearing, the NLC gearbox has high rigidity and is perfectly suited for high radial and axial loads. The IP65 sealing provides protection against dust and water.
Power density	+++	++	++
Bearing load	+	++	+++
For high input speed	++	++	+
Protection level	+	+	++
Comparable Gearboxes from other suppliers	NRB → PLE from Neugart; NRB is mechanically compatible to: - CP from Wittenstein - PGII from Apex	NRK → PLPE from Neugart NRK is mechanically compatible to; - LP+ / NP from Wittenstein - 1FK7 NP - PEII von Apex	NLC → PLHE from Neugart NLC is mechanically compatible to: - NPS from Wittenstein - Same dimensions as SP+ from Wittenstein, but different gearbox class (SP+ is a precision gearbox)
Price	€	€	€€

SIMOGEAR gearbox for SIMOTICS S-1FK2 with KS adapter



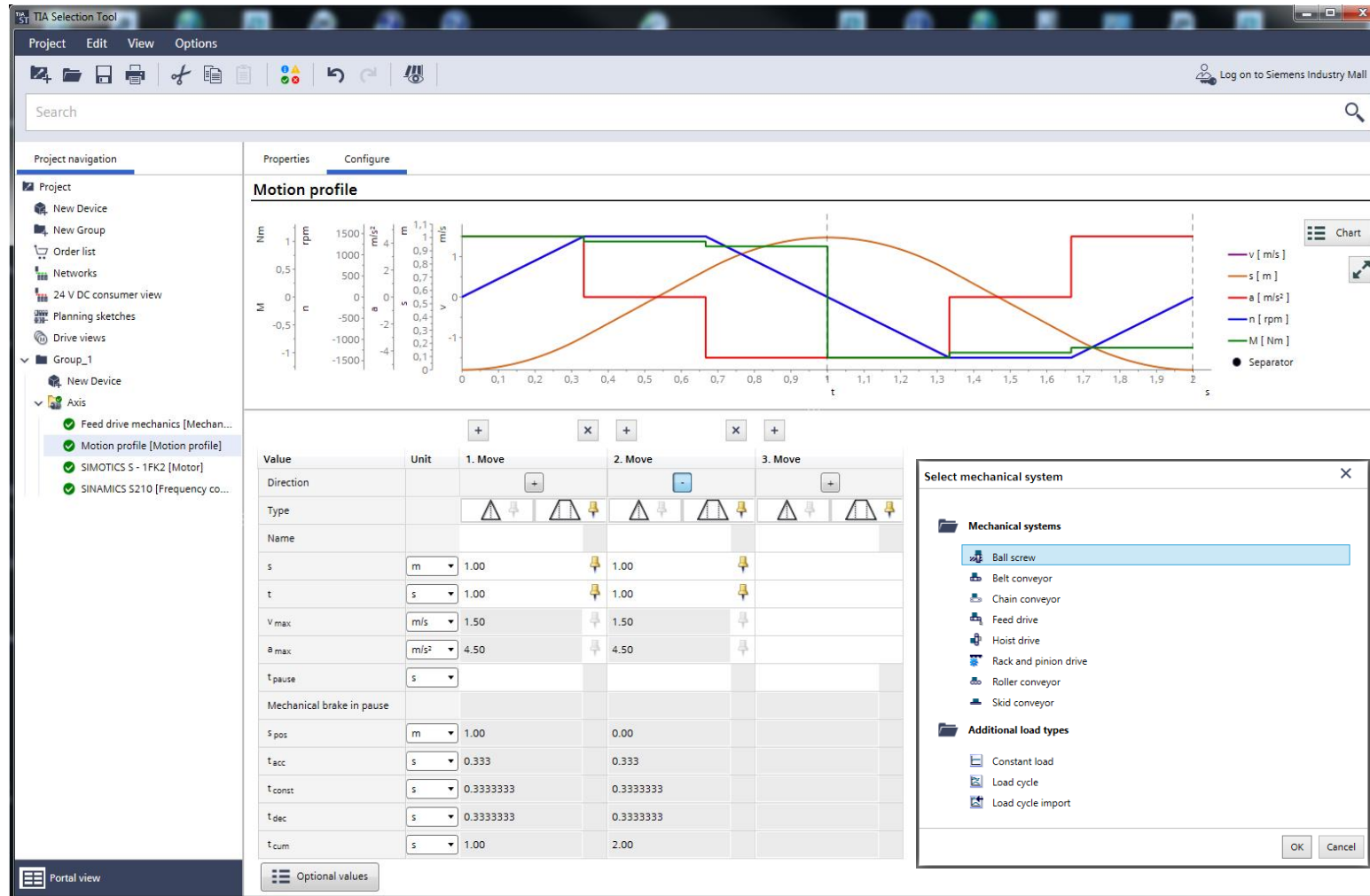
Adapter to connect SIMOGEAR to SIMOTICS S-1FK2

- Connection of servomotors via KS adapter
- Backlash-free coupling without feather key connection
- 4 different gear types of SIMOGEAR Family (helical-, flat-, bevel- and helical-worm gear units)
- [SIMOGEAR Catalog MD.50.11](#)
- [SIMOGEAR Konfigurator](#)



SINAMICS S210 Servo Drive System Selection via TST

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- Drive selecting TIA Selection Tool with the plug in “Drive System”.
- Configuration of the S210 servo drive systems & Gearboxes
- Interfaces to TIA Portal and Industry Mall (Customer Price)
- Different mechanical Systems (ball screw, conveyor, hoist...)
- Brake-Resistor calculation
- DC-coupling calculation
- Planetary Gearboxes and thermal simulation thanks to the digital twin of the SIMOTICS S-1FK2 Servo Gear Motor

SINAMICS S210 Servo Drive System STARTER Kits

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The screenshot shows the Siemens Industry Mall website. The main header includes the Siemens logo and 'INDUSTRY MALL'. Below the header, there's a navigation bar with links like 'Home', 'English', 'Kontakt', 'Hilfe', 'Site Explorer', and 'Produktsuche'. The main content area features a large banner for 'Skalierbare Motion Control-Lösungen im TIA Portal' with images of SIMATIC and SINAMICS hardware. To the left of the banner is a sidebar with a 'Produktkatalog' dropdown and a list of categories: Antriebstechnik, Automatisierungstechnik, Energy, Gebäudetechnik, Niederspannungs-Schaltechnik, Sicherheitstechnik - Safety Integrated, Branchenlösungen, Industry Services, Software, and '... und was Sie sonst noch brauchen'. Below the banner, there's a section titled 'Skalierbare Motion Control-Lösungen im TIA Portal mit SIMATIC und SINAMICS Starter Kits für den schnellen Einstieg'. This section includes text about the starter kits and a list of three packages with their article numbers and prices:

- Paket „SIMATIC S7-1500 CPU 1511C-1PN, Kompakt-CPU Starter Kit“**
Artikelnummer: > 6ES7511-1CK02-4YB5 Preis: 1.299 €
- Paket „SIMATIC S7-1500 CPU 1511T-1PN, Technologie-CPU Starter Kit“**
Artikelnummer: > 6ES7511-1TK01-4YB5 Preis: 999 €
- Paket „SINAMICS V90-PN Servo Drive System“**
Artikelnummer: > 6SL3200-0AE40-0AA0 Preis: 344 €
- Paket „SINAMICS S210 Servo Drive System“**
Artikelnummer: > 6SL3200-0AE60-0AA0 Preis: 590 €

Below the packages, there are links for 'Mehr zu SIMATIC Starter-Kits', 'SIMATIC Technology im Online Support', 'SINAMICS V90-PN Webseite', and 'SINAMICS S210 Webseite'. On the right side of the main content area, there are several smaller sections: 'Wissen kompakt: Maschinen-Steuerschränke richtig projektieren', 'Innovative Lösung für Rezeptursteuerungen', 'Innovative Weiterbildung mit SITRAIN', 'Gute Zusammenarbeit im digitalen Zeitalter', 'Industry Mall', 'Direktangebot', and 'Mobile Apps "Siemens2Go"'. Each section has a small image and a brief description.

Content:
400W Motor/Drive
Abs. Multiturn encoder
3m Cable
Incl. Ext. Safety Licence +
+ FW5.1 SP1 SD-Card

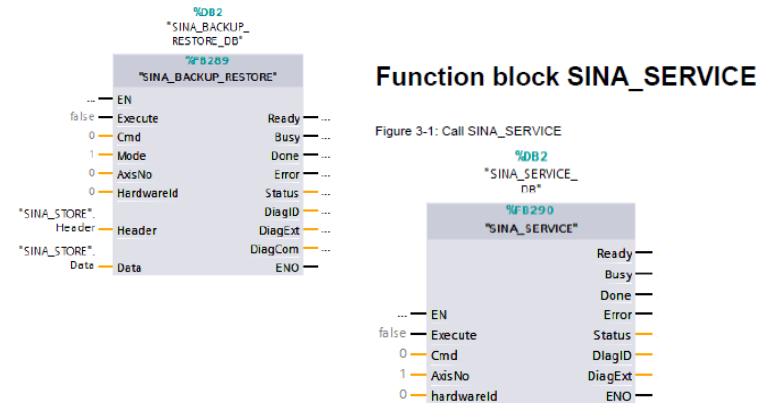
Max 3 pieces per customer.

Article number:
6SL3200-0AE61-0AA0

Standard Examples for SINAMICS S210

Function block SINA_BACKUP_RESTORE

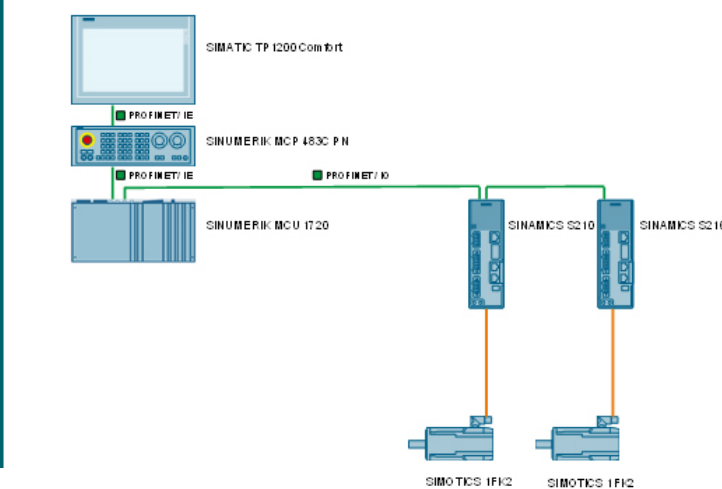
Figure 2-1 Call SINA_BACKUP_RESTORE



New SIMATIC Function Block for S210 sparepart replacement and serial comissioning:

Backup and Restore of the SINAMICS S210 device settings with SIMATIC. Two SIMATIC function blocks to control several drive functions of the SINAMICS S210. The function block SINA_BACKUP_RESTORE is used to save drive settings remanently in the controller's memory. The drive settings therefore are stored in a global DB of the controller. By the function block the stored settings can be transferred to a drive device.

[Link](#)

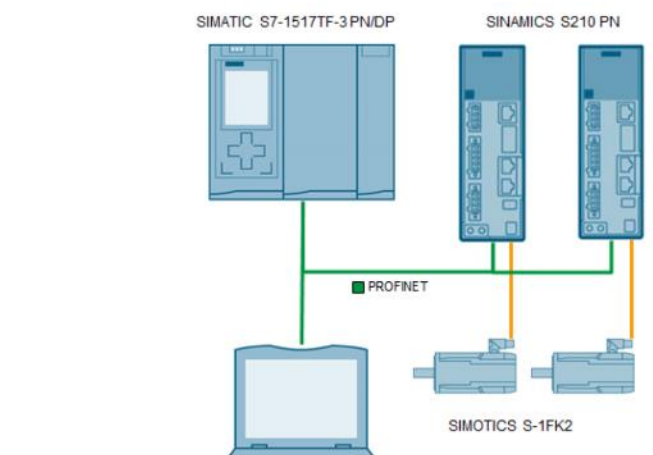


SINUMERIK MC and S210 as NC axis

Commissioning of NC-axis on SINUMERIK MC over PROFINET IRT with SINAMICS S210

This application example describes how to interface a SINUMERIK MC with a SINAMICS S210 via PROFINET IRT. Two drives are used as NC axes. The SIMATIC TP1200 Comfort is used as the HMI device, and the SINUMERIK MCP 483C PN is used to control the movement of the axes.

[Link](#)

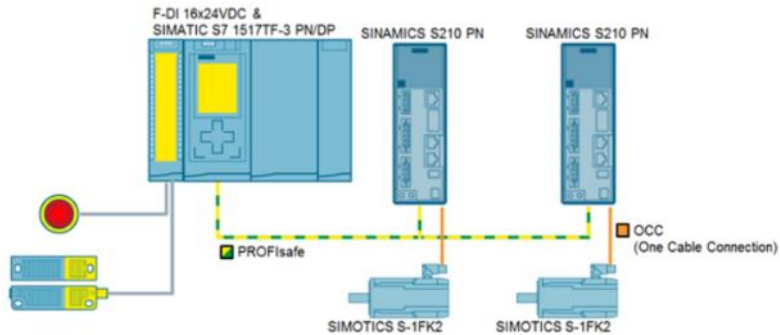


Configuring Technology Objects with SIMATIC S7 1500 and SINAMICS S210 in TIA-Portal.

In this application example, two "SINAMICS S210" will be used. The first one will act as position-controlled drive and will serve as master axis for the second drive configured with gear synchronization.

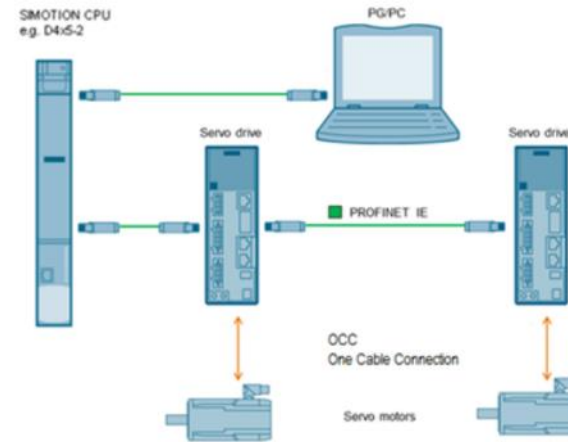
[Link](#)

Standard Examples for SINAMICS S210



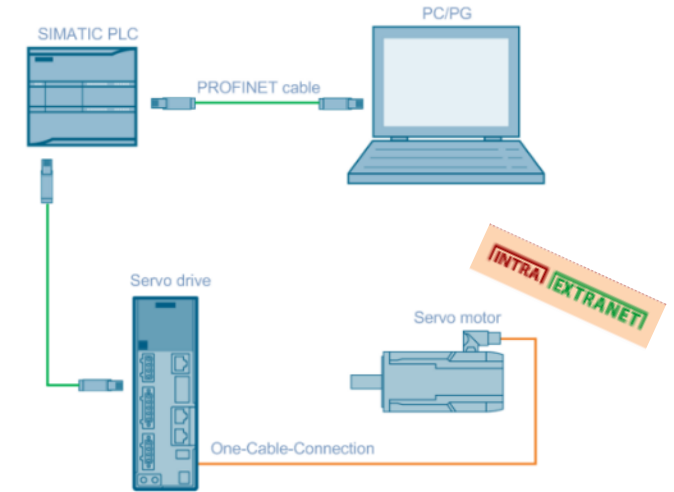
Controlling SINAMICS S210 Safety Integrated Functions using SIMATIC S7-1500TF via PROFIsafe

In addition to the standard drive functions, using a SIMATIC F-PLC, the (Extended) Safety Integrated Functions of a SINAMICS S210 can be controlled using PROFIsafe [Link](#)



Configuring technology objects with SIMOTION SCOUT TIA and SINAMICS S210

In this application example, "SINAMICS S210" drives are used, and are linked using a GSD file. The S210 drives are moved via the axis control panel of the SIMOTION technology objects. [Link](#)



Position Control with SIMATIC S7-1200 and SINAMICS S210

The SINAMICS S210 works in this application in speed control mode (S mode) and the communication will use PROFINET RT. In this manual the basic application "Position control with a S7-1200 and SINAMICS S210" will be described in detail. The described solution in this document contains the variations which have some detailed technical issues to look at it. [Link](#)

Tack för visat intresse!

Sinamics S210 – nya motortyper, växlar och TIA Selection Tool
Presentatör Dag Bauer



Mail: dag.bauer@siemens.com
Tel: 0725-44 25 28

Länkar

New SIMATIC Function Block for S210 spare part replacement and serial comissioning:

<https://support.industry.siemens.com/cs/ww/en/view/109769958>

SINUMERIK MC and S210 as NC axis:

<https://support.industry.siemens.com/cs/ww/en/view/109769849>

Configuring Technology Objects with SIMATIC S7 1500 and SINAMICS S210 in TIA-Portal:

<https://support.industry.siemens.com/cs/ww/en/view/109749795>

Controlling SINAMICS S210 Safety Integrated Functions using SIMATIC S7-1500TF via PROFIsafe

<https://support.industry.siemens.com/cs/ww/de/view/109760341>

Nästa tillfälle är torsdagen den 7 maj

NET - SINEC FAMILY - SINEC NMS –

Övervakning av Industriella Nätverk

Presentatör Christoffer Karlsson och Peter Appelquist