

Energy efficiency class IE4 for decentralized installations

**Mechatronic drive systems
MOVIGEAR® and DRC.. electronic motor**



Extremely efficient: Mechatronic drive systems in efficiency class IE4

Rising energy prices are not the only reason for system manufacturers and operators to face the challenges of saving energy, reducing costs, and increasing profitability when planning new systems or expanding existing production facilities.

Decentralized installations have already been used since the end of the 90s as a profitable alternative to centralized solutions for spacious machines or production systems.

It is in particular in spacious production plants that decentralized installation concepts can help achieve impressive cost savings. Unlike centralized solutions, control cabinet space and the amount of cabling is reduced significantly.

For example, using mechatronic MOVIGEAR® drive systems or DRC.. electronic motors with SNI communication (Single Line Network Installation) requires only one cable for energy and information transfer.

Decentralized components from SEW-EURODRIVE have always been innovative. MOVIMOT®, for example, the gearmotor with integrated frequency inverter has already been successfully used for decades in many conveyor systems in the most various industries. The new MOVIGEAR® mechatronic drive systems and the DRC.. electronic motor are two more energy efficient solutions SEW-EURODRIVE offers in energy efficiency class IE4.

Driving the world – with innovative drive solutions for all branches of industry and for every application. Products and systems from SEW-EURODRIVE for any application – worldwide. SEW-EURODRIVE products can be found in a variety of industries, e. g. automotive, building materials, food and beverage as well as metal-processing. The decision to use drive technology “made by SEW-EURODRIVE” stands for safety regarding functionality and investment.



Two solutions with IE4: MOVIGEAR® and DRC.. electronic motor


With MOVIGEAR®, the mechatronic drive system for horizontal materials handling technology, SEW-EURODRIVE has set completely new standards already in 2008 in terms of profitability and functionality. MOVIGEAR® not only combines a gear unit with a motor and the matching drive electronics in one product but, above all, ensures that the technical and economic advantages of these three drive components are maintained and utilized in an optimum manner. Apart from that,

MOVIGEAR® complies with efficiency class IE4 (Super Premium Efficiency). Since the beginning of 2012, the DRC.. electronic motor has given fresh impetus to decentralized installations: its versatile fields of use due to the flexibility in mounting any type of gear unit and the optional mechanical brake make the DRC.. electronic motor stand for innovative drive technology and highest product quality „made by SEW-EURODRIVE“.



An efficient unit comprising motor, gear unit and electronics: MOVIGEAR® in IE4

MOVIGEAR® – Technical data:

	<p>The MOVIGEAR® mechatronic drive system is available in two sizes and two mechanical variants:</p> <ul style="list-style-type: none"> – MOVIGEAR® sizes <ul style="list-style-type: none"> - MGF.2 (torque class: 200 Nm) - MGF.4 (torque class: 400 Nm) - MGF.4/XT (torque class: 400 Nm / increased torque) – MOVIGEAR® variants <ul style="list-style-type: none"> - MOVIGEAR® with hollow shaft and key - MOVIGEAR® with TorqLOC® hollow shaft mounting system
<p>MOVIGEAR® drive units</p>	
<p>Features and benefits</p>	<ul style="list-style-type: none"> – Compact design: Motor, gear unit and electronics are combined in a single mechatronic drive system – Installation topology with SEW controller: <ul style="list-style-type: none"> - SNI: only one cable for power supply and communication; installation effort reduced by up to 60% - SBus: for applications with higher performance requirements, such as angular synchronism, etc. – Installation topology binary or AS-Interface – Reduced number of variants due to wide setting range and universal mounting position – Lower storage costs – High degree of protection – Hygienic surface design for applications in hygienic areas – No air, dirt and germ swirls – Reduction of energy costs by up to 50% due to the high efficiency of all components (gear unit, motor, electronics) – High degree of reliability due to systematic development of all components – Reduced total costs and operating costs of the materials handling system – Integrated functional safety: Safe Torque Off (STO) up to PL e according to EN ISO 13849-1

NEW: in IE4 and flexibility in mounting any type of gear unit: the DRC.. electronic motor

DRC.. electronic motor – Technical data:



DRC.. 1-4

The figure shows the DRC.. 1-4

The new DRC.. electronic motor consists of a permanent-field synchronous motor with integrated drive electronics. The motor is available in 4 sizes:

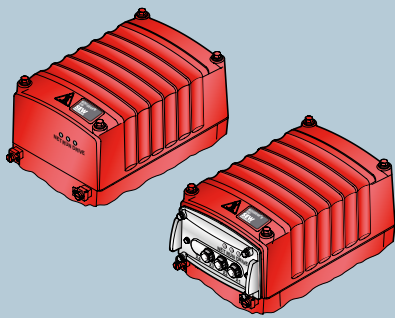
- Power:
- Size DRC.. 1:
0.55 kW (2.6 Nm rated torque)
- Size DRC.. 2:
1.5 kW (7.2 Nm rated torque)
- NEW: Size DRC.. 3:
3 kW (14.3 Nm rated torque)
- NEW: Size DRC.. 4:
4 kW (19.1 Nm rated torque)

Features and benefits

- Combination of a permanent-field synchronous motor (2,000 rpm rated speed) with integrated drive electronics in a completely enclosed housing:
 - No fan
 - Degree of protection IP65 and IP66
- NEW: 4 sizes with a nominal torque of 2.65 Nm, 7.2 Nm, 14.33 Nm and 19.1 Nm (continuous power 0.55 and 4.0 kW)
- A completely new mechatronic drive system is created together with a highly efficient helical-bevel, helical or parallel-shaft helical gear unit
- High gear unit flexibility:
 - Direct mounting to the gear unit using flange and pinion shaft
- Motor efficiency class IE4 (Super Premium Efficiency) of the international standard IEC 60034
- Energy savings up to 50%
- Overload capacity of 250%
- Universal application due to large control range of 1:2000
- Mechatronic drive system from a single source: All individual components are perfectly matched, are reliable and durable, and significantly contribute to a high level of system availability
- Installation topology with MOVIFIT®-FDC-SNI controller:
 - Only one cable for power supply and communication
 - Considerably less cabling effort than with conventional solutions
 - Installation effort reduced by up to 60%
- Installation topology binary or AS-Interface:
 - For stand-alone applications or systems with simple drive functionalities
- Installation topology with SEW system bus controller makes for highest performance and short response times for implementing demanding drive tasks
- Integrated STO safety function (Safe Torque Off)

Impressive combination: Functionality and design of mechatronic drive systems

Application options



Electronics cover without application slot, electronics cover with application slot (with installed GIO12B option)

Application options

Electronics cover with application option for connecting digital inputs and outputs



The following types of electronics covers are available for all sizes of MOVIGEAR®/DRC..-DSC-B and MOVIGEAR®/DRC..-SNI-B units:

- Electronics cover without application slot
- Electronics cover with application slot

The electronics cover of MOVIGEAR®/DRC..-DBC-B and MOVIGEAR®/DRC..-DAC-B is designed without application slot.

Application options are installed in the application slot of MOVIGEAR®/DRC... These options implement specific interfaces, such as binary inputs or binary outputs. The energy supply of the option as well as the communication between MOVIGEAR®/DRC.. and the option is contactless.

GIO12B application option

The GIO12B application option allows for controlling up to 2 digital actuators and for processing up to 4 digital sensors.

GIO13B application option

The GIO13B application option comes equipped with the following interfaces:

- 1 digital output
- 4 digital inputs (two of them can be used as primary frequency input)
- 1 analog output
- 1 analog input

Features and benefits



The DRC.. electronic motor completes the product portfolio of mechatronic drive systems with a drive solution that is particularly flexible in terms of gear unit mounting.

Helical, parallel-shaft helical and helical-bevel gear units are directly mounted via flange and pinion shaft end.

This flexibility and the resulting universal use make the mechatronic drive systems attractive for many industries, such as logistics, automobile industry, food and beverage industry, airport logistics, and construction industry. MOVIGEAR® and DRC.. electronic motor provide optimal and efficient mechatronic drive solutions, for example for belt and chain conveyors, corner transfer units or palletizers. Equipping the DRC.. with an optional brake makes it also suited for use in inclining tracks and hoists.

- Motor efficiency class IE4 allows for saving up to 50% of energy
- Mechatronic drive systems from a single source:
All individual components are perfectly matched, are reliable and durable, and significantly contribute to a high level of system availability.

Best possible energy efficiency reduces energy and operating costs

Using any opportunity to save energy is not only an important contribution to conserving the environment but also pays off financially. This also affects the selection and projecting of modern drive technology. The drive technology used and its overall efficiency play a crucial role in sustainably reducing the energy consumption in industrial applications.

A simple equation illustrates this:

$$P_{\text{Input}} = P_{\text{Output}} + P_{\text{Losses}}$$

This means that the costs for electrical energy input P_{Input} are calculated from the effectively

needed mechanical energy P_{Output} plus losses P_{Losses} resulting from the overall efficiency. The following applies disregarding the application and the system: Energy costs can only be reduced if energy losses during plant operation are kept as low as possible.



Verified by an independent entity: Energy saving potential of up to 50%

“A comparison of the test results shows a significant efficiency advantage of MOVIGEAR® drives ... over the entire load range.”

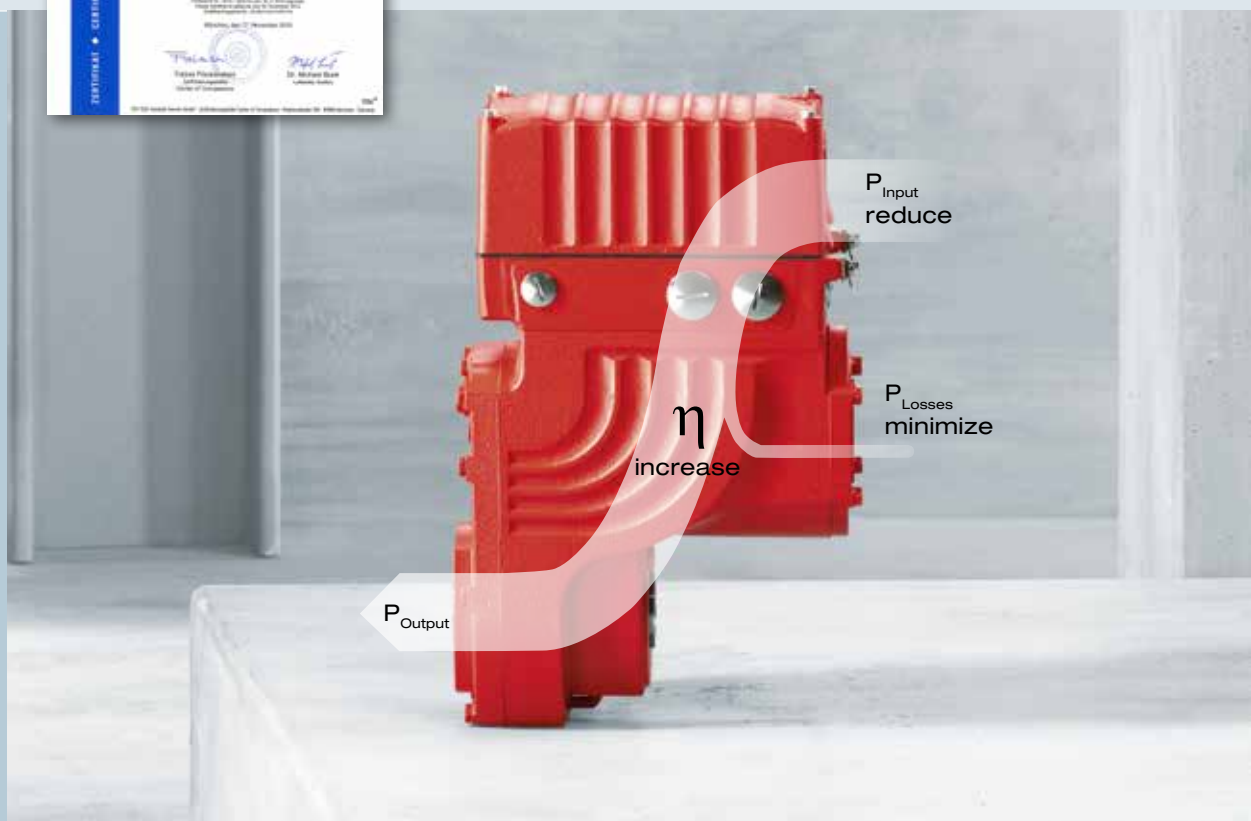
Source: Report of the University of Applied Sciences of Kaiserslautern on the efficiency measurement of the mechatronic drive system MOVIGEAR®

TÜV SÜD confirms that MOVIGEAR® requires up to 50% less energy compared to other drive systems available on the market and awards the

mechatronic drive system the certificate “Energy-Efficient Plant Technology”.

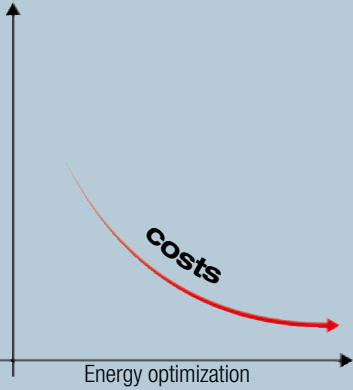



University of Applied Sciences of Kaiserslautern
Department of Applied
Engineering Sciences



Tried and tested energy savers

Mechatronic drive systems not only actively contribute to the conservation of resources and the environment, they also offer system manufacturers and operators a true cost-saving alternative to conventional, centralized installation solutions.

	MOVIGEAR®	DRC.. electronic motor
 <p>Reducing energy costs by increasing the overall efficiency</p>	<ul style="list-style-type: none"> – High overall efficiency of all components (motor, gear unit and electronics): – Optimized interfaces between motor and gear unit – Permanent-field synchronous motor – Highly efficient gearings – New electronic components and intelligent control methods 	<ul style="list-style-type: none"> – High gear unit flexibility: – Direct mounting to the gear unit using flange and pinion shaft – A completely new mechatronic drive system is generated together with a highly efficient helical-bevel, helical or parallel-shaft helical gear unit – Optionally with mechanical brake
	<ul style="list-style-type: none"> – The highest motor efficiency complies already today with efficiency class IE4 (Super Premium Efficiency) of the international standard IEC 60034 – New electronic components and intelligent control modes – Proven energy-saving potential of up to 50% depending on the application – Significantly reduced reactive power consumption compared to motors operated directly on the mains supply helps ensure that reactive power limit values are complied with – Sustainable reduction of CO₂ emissions helps protecting the environment 	

Latest measurements on a belt conveyor in a logistics center show the following result:*

- Average reduction of the power consumption by approx. 820 kwh/year per drive
- Reduction of energy consumption by 56%
- Reduction of CO₂ emissions of 532 kg/year per drive
- € 98.00 of energy saved per drive/year

* Calculation based on customer data with energy costs of 0.12 €/kwh and a runtime of 16 hours per day and 220 days per year.

The **higher costs** compared to conventional drive solutions are **compensated within only one or two years** by the saved energy expenses.



Solutions for sensitive areas

In addition to objectives such as “higher productivity” or “cost reduction”, the system environment is becoming an increasingly important criterion for the development of modern machines and systems. Until now, compliance with normative limit values has served system operators as a gauge for determining the environmental impact. In the meantime however, the creation of high-quality workplaces has become one of the key purchase criteria. This is why the influences on the system environment, such as noise emission, are analyzed thoroughly.

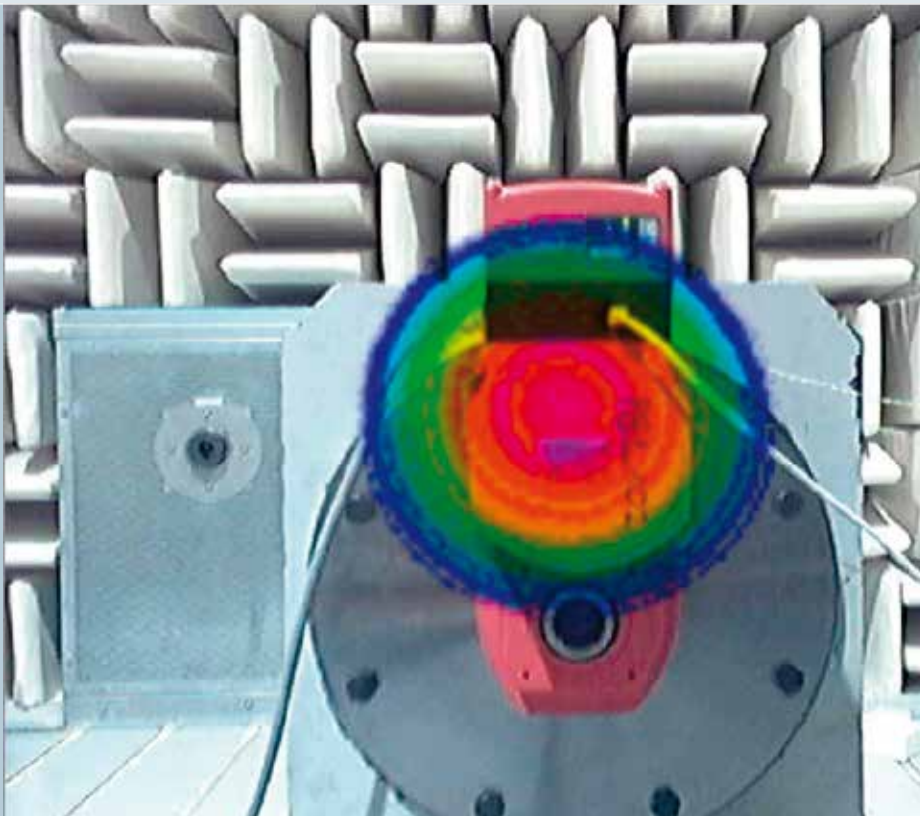


Low noise emissions improve the quality of the workplace

In conventional drives, air swirls and vibrations in the fan guard account for most of the noise. This is the reason why SEW-EURODRIVE aimed at developing a drive without fan.

This has now been successfully achieved with the mechatronic components: both MOVIGEAR® and the DRC.. electronic motor do not have a fan

and therefore significantly contribute to reducing noise in the plant.



Demanding areas of application? No Problem

Clean room

Energy efficiency and cleanliness in clean rooms are not mutually exclusive, at least not when using the decentralized drive components of SEW-EURODRIVE. MOVIGEAR® and the DRC.. electronic motor are easy to clean and comply with the demanding requirements on the hygienic conditions in clean rooms with regard to air quality and permitted number and size of particles released.

The EN ISO 14644 standard stipulates the requirements on clean rooms and associated clean room areas. The mechatronic MOVIGEAR® drive system complies, for example, with air cleanliness class 2 according to ISO 14644-1 and consumes about 50% less energy than conventional drive solutions.

Energy efficiency in clean rooms made easy:
Many machine and plant operators have already been benefitting from the impressive energy-saving potential of

MOVIGEAR® and DRC.. in their production and logistics facilities and have been successfully implementing “clean room compliant” decentralized concepts.

For example suited for the

- Chemical, pharmaceutical and cosmetic industries
- Biotechnology
- Food industry
- Medical technology
- Semiconductor industry
- Solar panel production



The Fraunhofer Institute certifies that the MOVIGEAR® drive for clean room applications meets the requirements up to air cleanliness class 2 according to ISO 14644-1, depending on the motor speed, and that the drive can be operated in such applications.



Wet areas

The mechatronic MOVIGEAR® drive system variant for use in wet areas is specifically designed for applications in permanently wet areas, such as hygienic areas in the food and beverage industry. Even regular acidic or caustic wet cleaning is no problem and

cleaning inaccessible areas is possible thanks to the non-stick properties of the surface. The smooth surface prevents dirt from adhering to it – the mechatronic components are virtually self-cleaning.

MOVIGEAR®: Wet area features



Design

- Smooth overall design and compact unit comprising gear unit, motor, and electronics
- Facilitates thorough cleaning of the entire drive system and results in a reduced emission of particles
- Available in two sizes covering a torque range from 20 Nm to 400 Nm.

Without fan

- No swirling of air, dirt, and particles
- Reduced noise emission
- Allows for complying with noise limits at the workplace

MOVIGEAR® variants for use in wet areas

- Special anti-stick surface
- Makes for easier cleaning
 - Prevents paint flaking at the interfaces as the surface is treated prior to assembly and burnt into the housing material
 - Prevents particles from sticking to the surface
 - Resistant against mechanical stress and common cleaning agents

Cost-effectiveness

- Reduction in energy costs by up to 50% due to high overall efficiency

Sample applications

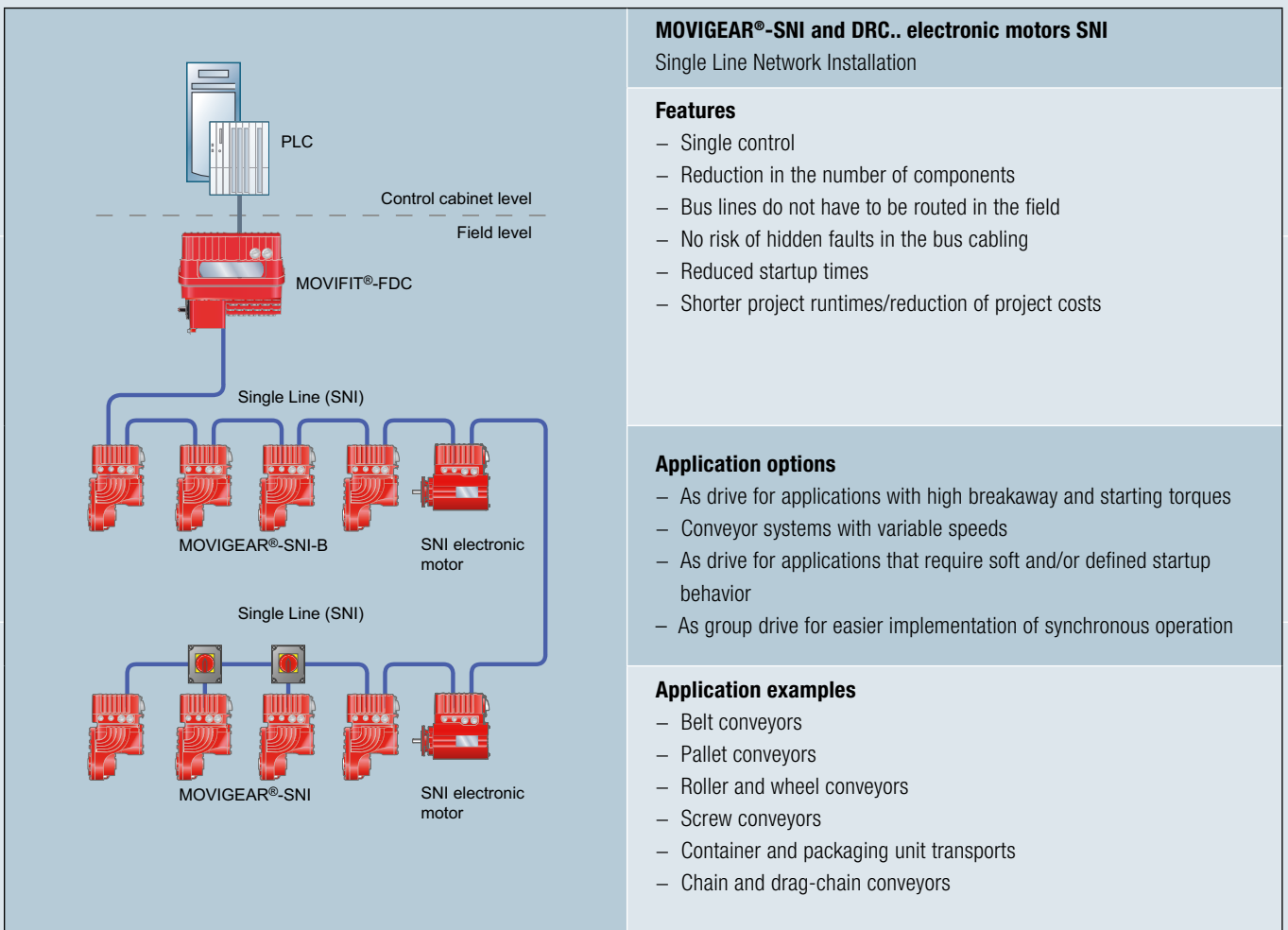
- Hygienic and aseptic conveyors in the beverage industry
- Systems in cheese dairies and butcher shops
- “Splash zones” in the food industry

Installation topologies of mechatronic drive systems: SNI and SEW system bus

Single Line Network Installation

With MOVIGEAR®-SNI and the DRC.. electronic motor SNI, completely new system concepts can be implemented as energy and data are transferred via one standard cable. This principle is referred to as Single Line Installation. Simplified installation leads to significantly reduced installation and system costs.

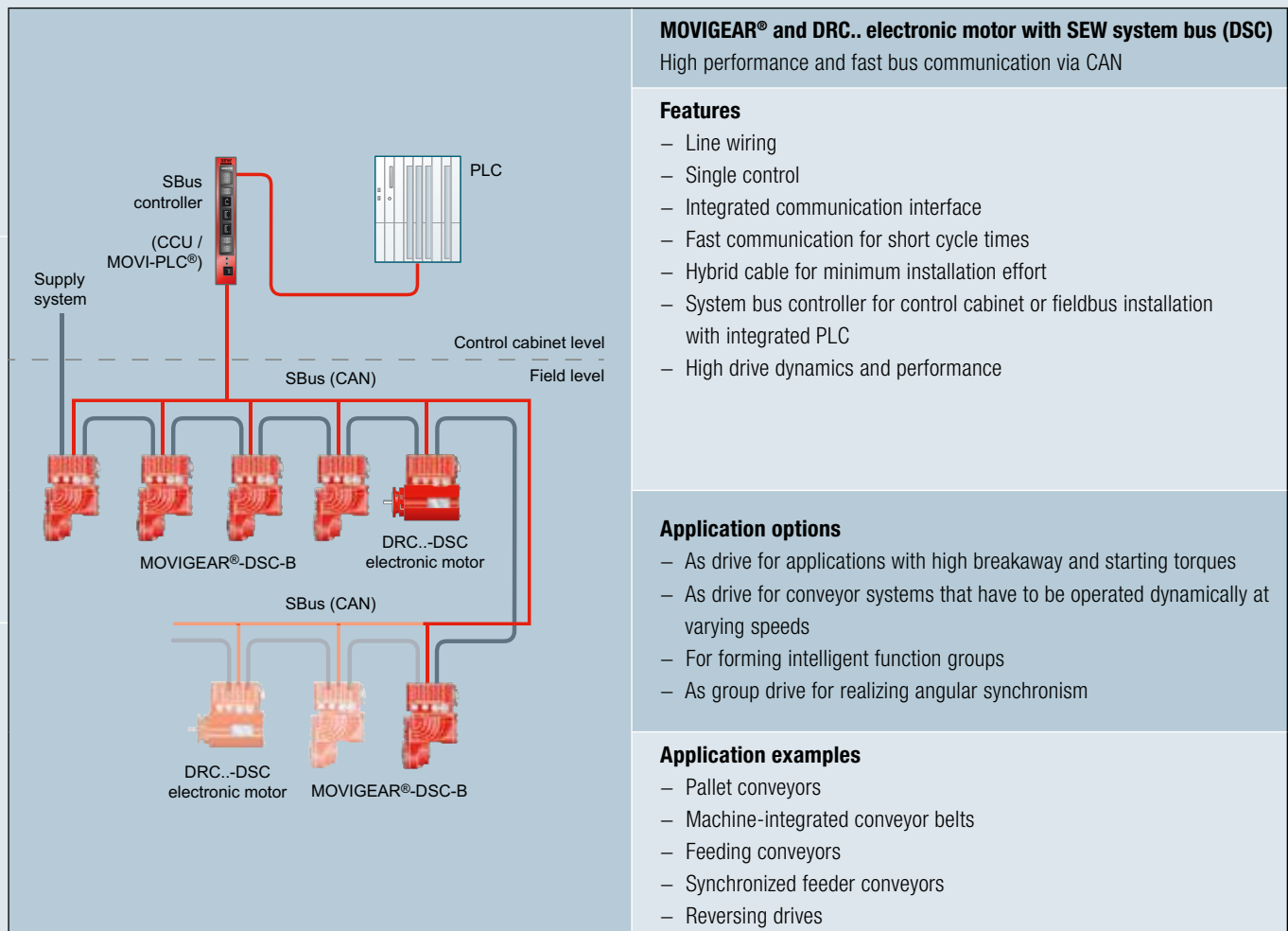
Installation topology with SNI controller



High performance and fast bus communication

The SEW system bus allows for the functional integration of MOVIGEAR®-DSC and the DRC.. electronic motor DSC in applications close to the machine. High performance and short response times distinguish this variant and enable the reliable implementation of challenging drive tasks.

Installation topology with SEW system bus controller



Installation topologies of mechatronic drive systems: Binary and AS-Interface

Stand-alone operation

The "binary" installation topology solution with MOVIGEAR®-DBC and the DRC.. electronic motor DBC from SEW-EURODRIVE are specifically suited for stand-alone applications as well as applications with simple functions: DIP switches and potentiometers allow for simple and fast startup, no PC is required. The devices can be controlled via binary inputs either by a central PLC or in local/manual mode.

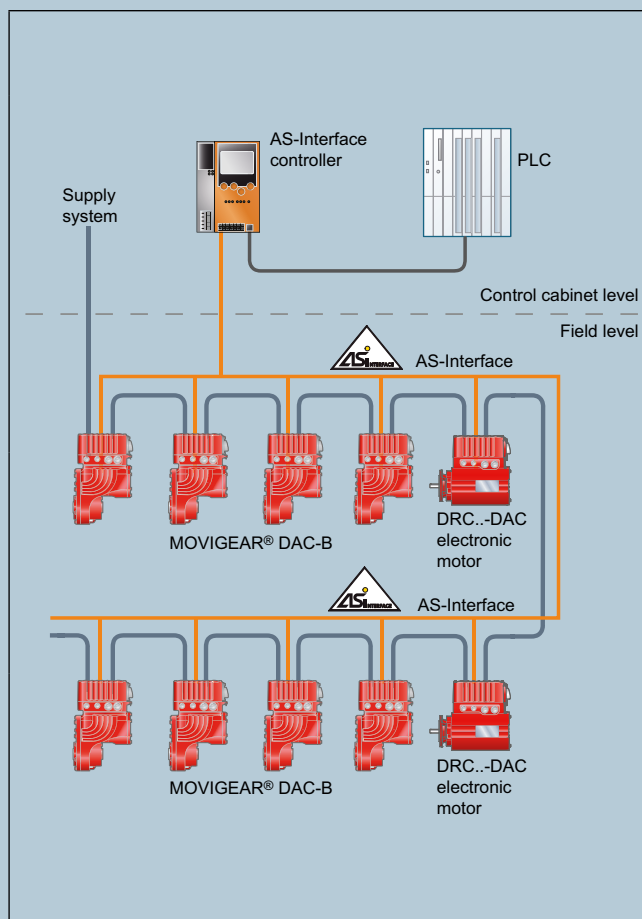
Installation topology binary

<p>Binary MGF</p> <p>MOVIGEAR®-DBC-B</p>	<p>MOVIGEAR® and DRC.. electronic motor binary (DBC) Stand-alone operation</p> <p>Features</p> <ul style="list-style-type: none"> – Simple startup without PC using DIP switches and potentiometer – Parameterizable fixed speeds and ramps – Binary input control and signal relay evaluation via PLC – Local/manual operation via binary inputs – Interface for diagnostics and parameterization
<p>Binary DRC..</p> <p>DRC..-DBC electronic motor</p>	<p>Application options</p> <ul style="list-style-type: none"> – Simple stand-alone applications and single applications – For applications that require soft startup behavior – Applications with two fixed speeds – For applications with high breakaway torques – As a replacement for line-powered drives <p>Application examples</p> <ul style="list-style-type: none"> – Simple conveyors – Rotary tables – Actuating drives – Agitators and mixers – Crushers and shredders – Presses

Cost-effective fieldbus connection

The installation topology with AS-Interface is the simple fieldbus connection variant for MOVIGEAR®-DAC and the DRC.. electronic motor DAC. Parameterizable fixed speeds and ramps, integrated STO safety function and connection options for external sensors ensure fast and extremely efficient implementation of material handling systems.

Installation topology with AS-Interface



MOVIGEAR® and DRC.. electronic motor AS-Interface (DAC)

Simple and economical fieldbus connection

Features

- Parameterizable fixed speeds and ramps
- Control via standard AS-Interface specification
- Connection of external sensors on the actuator
- Voltage supply for connected sensors
- Local/manual operation via binary inputs
- Interface for diagnostics and parameterization
- Available in 2 slave variants:
 - Binary slave (GLK30)
 - Double slave (GLK31)

Application options

- Simple fieldbus connection
- For applications that require soft startup behavior
- Signal feedback of connected sensors
- For applications that require a lot of space
- Individual parameter access in connection with GLK31

Application examples

- Accumulating roller conveyors
- Roller and wheel conveyors
- Pallet conveyors
- Rotary tables

SEW-EURODRIVE is right there for you:

Argentina

Tel. +54 3327 4572-84
Fax +54 3327 4572-21
sewar@sew-eurodrive.com.ar

Australia

Tel. +61 3 9933-1000
Fax +61 3 9933-1003
enquires@sew-eurodrive.com.au

Austria

Tel. +43 1 617 55 00-0
Fax +43 1 617 55 00-30
sew@sew-eurodrive.at

Belarus

Tel. +375 17 298 47 56
Fax +375 17 298 47 54
sales@sew.by

Belgium

Tel. +32 16 386-311
Fax +32 16 386-336
info@sew-eurodrive.be

Brazil

Tel. +55 19 3835-8000
sew@sew.com.br

Cameroon

Tel. +237 233 39 02 10
Fax +237 233 39 02 10
sew@sew-eurodrive.cm

Canada

Tel. +1 905 791-1553
Fax +1 905 791-2999
marketing@sew-eurodrive.ca

Chile

Tel. +56 2 2757 7000
Fax +56 2 2757 7001
ventas@sew-eurodrive.cl

China

Tel. +86 22 25322612
Fax +86 22 25323273
info@sew-eurodrive.cn

Colombia

Tel. +57 1 54750-50
Fax +57 1 54750-44
sew@sew-eurodrive.com.co

Czech Republic

Tel. +420 255 709 601
Fax +420 235 350 613
sew@sew-eurodrive.cz

Denmark

Tel. +45 43 95 8500
Fax +45 43 95 8509
sew@sew-eurodrive.dk

Finland

Tel. +358 201 589-300
Fax +358 3 780-6211
sew@sew.fi

France

Tel. +33 3 88 73 67 00
Fax +33 3 88 73 66 00
sew@usocome.com

Ghana

Tel. +233 303 963 772
info@sew-eurodrive.com.gh

Great Britain

Tel. +44 1924 893-855
Fax +44 1924 893-702
info@sew-eurodrive.co.uk

Hungary

Tel. +36 1 437 06-58
Fax +36 1 437 06-50
office@sew-eurodrive.hu

India

Tel. +91 265 3045200
Fax +91 265 3045300
marketing@seweurodriveindia.com

Italy

Tel. +39 02 96 9801
Fax +39 02 96 980 999
sewit@sew-eurodrive.it

Ivory Coast

Tel. +225 21 21 81 05
Fax +225 21 25 30 47
info@sew-eurodrive.ci

Japan

Tel. +81 538 373811
Fax +81 538 373814
sewjapan@sew-eurodrive.co.jp

Kazakhstan

Tel. +7 727 350 5156
Fax +7 727 350 5156
sew@sew-eurodrive.kz

Kenya

Tel. +254 791 398840
info@sew.co.ke

Malaysia

Tel. +60 7 3549409
Fax +60 7 3541404
sales@sew-eurodrive.com.my

Mexico

Tel. +52 442 1030-300
Fax +52 442 1030-301
scmexico@seweurodrive.com.mx

Morocco

Tel. +212 522 88 85 00
Fax +212 522 88 84 50
sew@sew-eurodrive.ma

Netherlands

Tel. +31 10 4463-700
Fax +31 10 4155-552
info@sew-eurodrive.nl

New Zealand

Tel. +64 9 2745627
Fax +64 9 2740165
sales@sew-eurodrive.co.nz

Norway

Tel. +47 69 24 10 20
Fax +47 69 24 10 40
sew@sew-eurodrive.no

Paraguay

Tel. +595 991 519695
Fax +595 21 3285539
sewppy@sew-eurodrive.com.py

Peru

Tel. +51 1 3495280
Fax +51 1 3493002
sewperu@sew-eurodrive.com.pe

Poland

Tel. +48 42 293 00 00
Fax +48 42 293 00 49
sew@sew-eurodrive.pl

Portugal

Tel. +351 231 20 9670
Fax +351 231 20 3685
infosew@sew-eurodrive.pt

Russia

Tel. +7 812 3332522
Fax +7 812 3332523
sew@sew-eurodrive.ru

Singapore

Tel. +65 68621701
Fax +65 68612827
sewsingapore@sew-eurodrive.com

Slovakia

Tel. +421 2 33595 202
Fax +421 2 33595 200
sew@sew-eurodrive.sk

South Africa

Tel. +27 11 248 7000
Fax +27 11 248 7289
info@sew.co.za

South Korea

Tel. +82 31 492-8051
Fax +82 31 492-8056
master.korea@sew-eurodrive.com

Spain

Tel. +34 94 4318470
Fax +34 94 4318471
sew.spain@sew-eurodrive.es

Sweden

Tel. +46 36 34 42 00
Fax +46 36 34 42 80
jonkoping@sew.se

Switzerland

Tel. +41 61 41717-17
Fax +41 61 41717-00
info@imhof-sew.ch

Tanzania

Tel. +255 22 277 5780
Fax +255 22 277 5788
info@sew.co.tz

Thailand

Tel. +66 38 454281
Fax +66 38 454288
sewthailand@sew-eurodrive.com

Turkey

Tel. +90 262 999 1000-04
Fax +90 262 999 1009
sew@sew-eurodrive.com.tr

Ukraine

Tel. +380 56 370 3211
Fax +380 56 372 2078
sew@sew-eurodrive.ua

United Arab Emirates

Tel. +971 4 8806461
Fax +971 4 8806464
info@sew-eurodrive.ae

Uruguay

Tel. +598 2 2118189
Fax +598 2 2118190
sewuy@sew-eurodrive.com.uy

USA

Tel. +1 864 439-7537
Fax +1 864 439-7830
cslyman@seweurodrive.com

Uzbekistan

Tel. +998 71 2359411
Fax +998 71 2359412
sew@sew-eurodrive.uz

Venezuela

Tel. +58 241 832-9804
Fax +58 241 838-6275
ventas@sew-eurodrive.com.ve

How we're driving the world



SEW-EURODRIVE
Driving the world

SEW
EURODRIVE

SEW-EURODRIVE GmbH & Co KG
P.O.Box 30 23
76642 Bruchsal/Germany
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com

→ www.sew-eurodrive.com