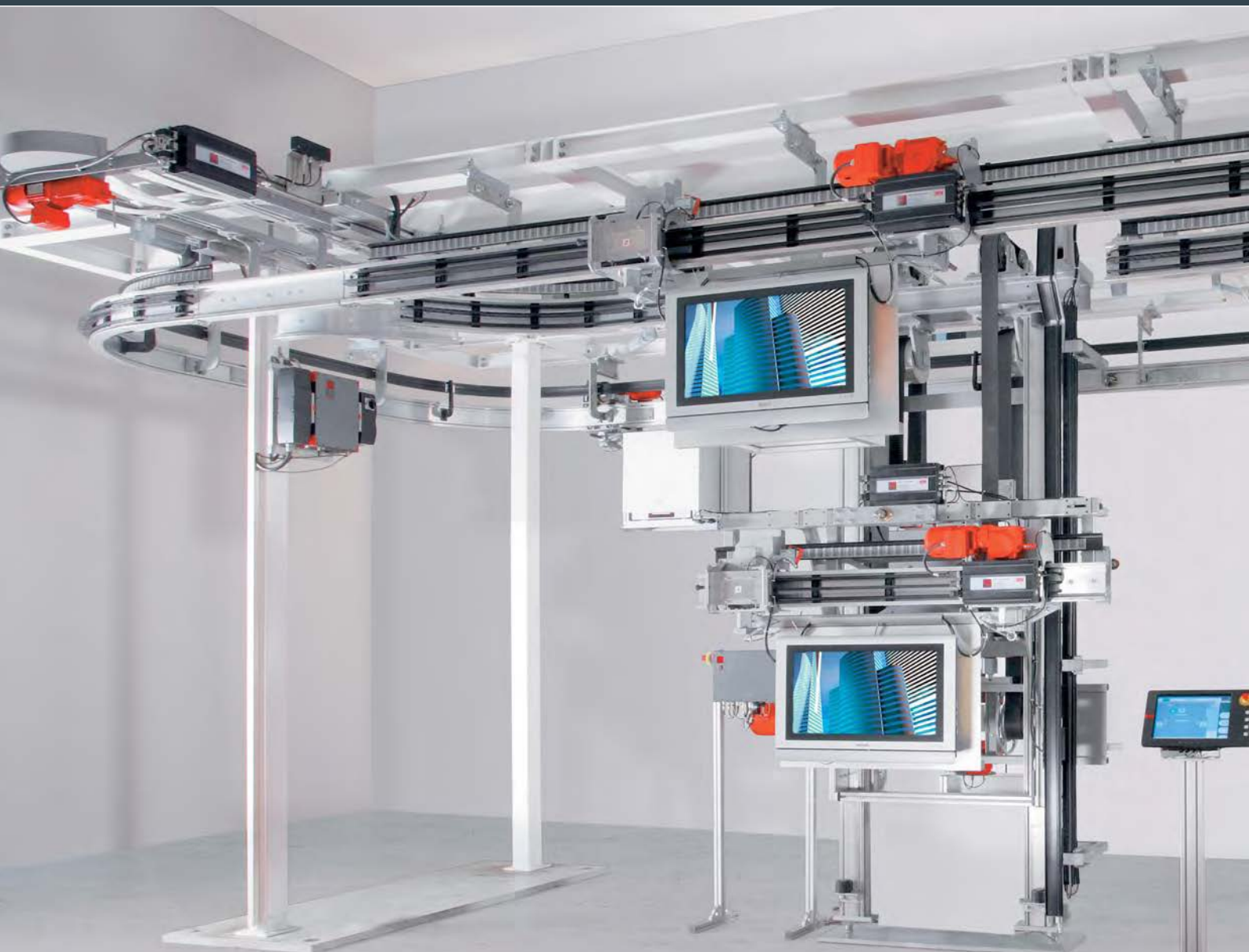


Product Announcement

EMS application system solution

**Electrified monorail system**





## The perfect mix for every motion: System integration made by SEW-EURODRIVE

Look forward to a concept that will change the world of drive technology. From now on, it doesn't matter what your drive problem looks like: The new system integration concept is SEW-EURODRIVE's turnkey solution for you.

All components and subsystems are integrated in the overall system. The result is an application system solution tailored precisely to your requirements. The necessary standardization and matching of all components leads to a smaller number of interfaces and reduces maintenance storage. As a consequence, the costs occurring during the entire product life cycle decrease significantly.

At the same time, performance and flexibility of your system are improved and power consumption is reduced.

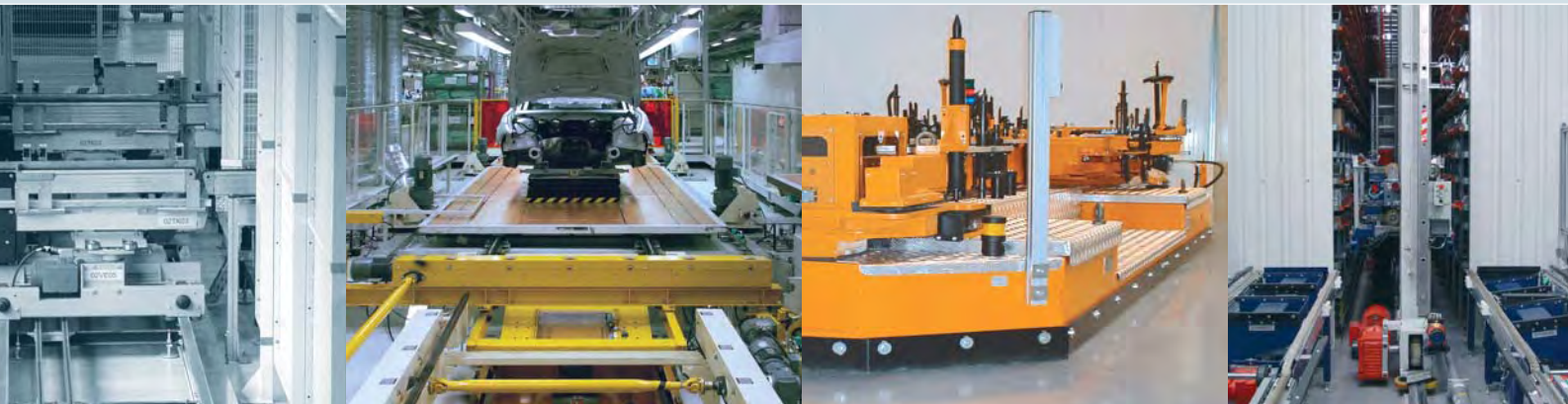
In addition to that, system integration made by SEW-EURODRIVE provides all the expertise and service from one source: from documentation to maintenance.

## Your Requirement – Our Solution

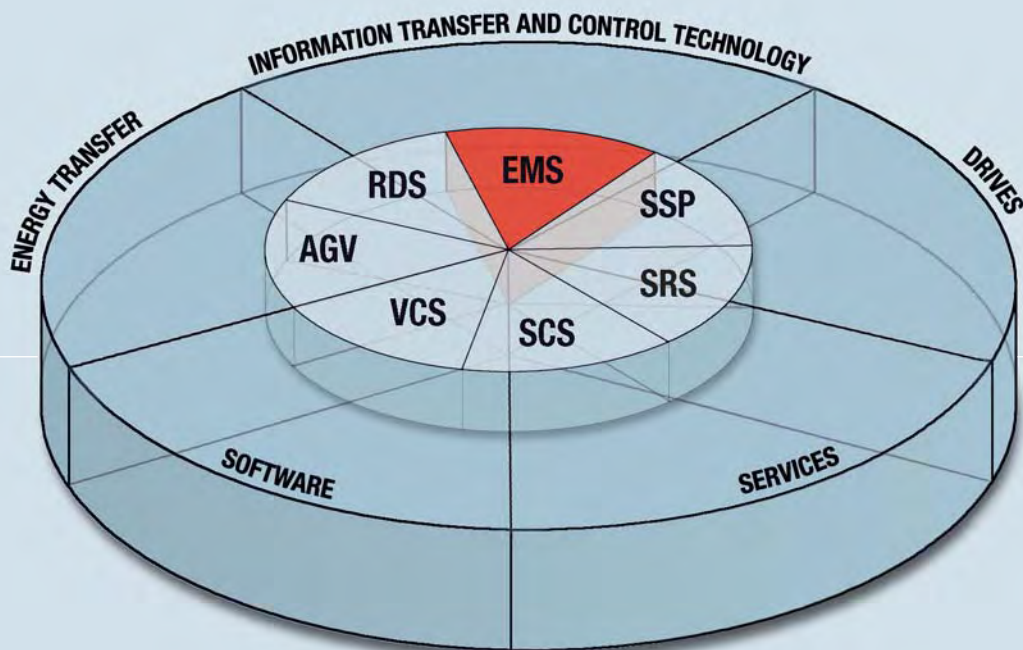
For decades, drive technology made by SEW-EURODRIVE has been successful due to high-quality products, excellent performance and service, worldwide availability, competence and application know-how. At SEW-EURODRIVE, we constantly strive for improvement. This leads to new, innovative products and system modules, which will continue to set standards. Take the new modular application system as an example: It combines single products and system packages to individual, functional application system solutions perfectly matched to the application requirements, such as the “Electrified Monorail System / EMS” for overhead trolley systems.

SEW-EURODRIVE develops, tests and improves the solutions in close cooperation with leading system designers and operators.

High-quality production processes and shortest possible delivery times ensure greater efficiency for any system in any industry sector.



## Modular application system



### Application

- Overhead trolley system
- Skillet conveyor with elevating table
- Storage and retrieval system
- Conveyor trolley
- Vertical conveyor / hoist
- Automated guided vehicles
- Rotary distributor / rotary table

### System solution from SEW-EURODRIVE

- **EMS** / Electrified Monorail System
- **SSP** / Skillet Conveyor System with Power Supply
- **SRS** / Storage and Retrieval System
- **SCS** / Shuttle Conveying System
- **VCS** / Vertical Conveyor System
- **AGV** / Automated Guided Vehicle System
- **RDS** / Rotary Distribution System



The result are ready-to-use system solutions made by SEW-EURODRIVE from the proven product modular systems, combined with the new system modules: innovative, powerful and reliable.

## System solutions for electrified monorail systems

Regardless of the type and complexity of the system and the classification in light load or heavy load applications, traditional OHT systems require a vast amount of expensive technical equipment. Furthermore, these systems are not only time-consuming and cost-intensive in the planning phase, they are also prone to errors during operation.

The new two-stage function class concept from SEW-EURODRIVE offers an alternative: intelligent or modular EMS systems that meet the increased economic requirements.

**What is so special about the new concept: SEW-EURODRIVE is the first supplier to offer a complete solution: planning, project planning, all components, startup support, installation monitoring, and after sales services.**

The EMS application system solution is a flexible and efficient electrified monorail system that can be used in any area where overhead transport is required and expensive floor space is to be saved. The electrified monorail system is classified depending on the load:

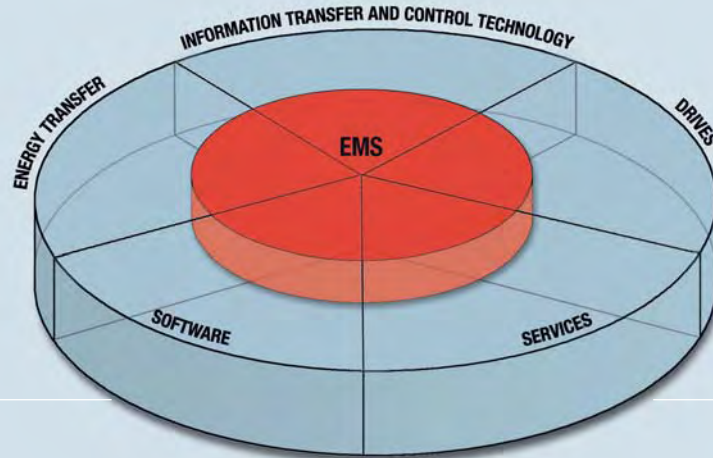
- EMS advanced for light loads (up to 1 ton per vehicle), or
- EMS customized for heavy loads




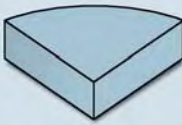
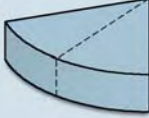

Single or multi axis vehicles are available for both load types.



For transmission of power or data, control, visualization and diagnostics, or the use of additional drives or encoder systems: The modular concept from SEW-EURODRIVE offers all components required for the implementation of overhead trolley systems. All products are perfectly in tune with each other and offer powerful and reliable system solutions. System operators and engineers opting for the EMS application solution made by SEW-EURODRIVE not only have the advantage of a technically highly developed and reliable electrified monorail system but also of a competent partner for planning, configuration, startup support and installation monitoring.

## The system modules of the EMS application solution at a glance



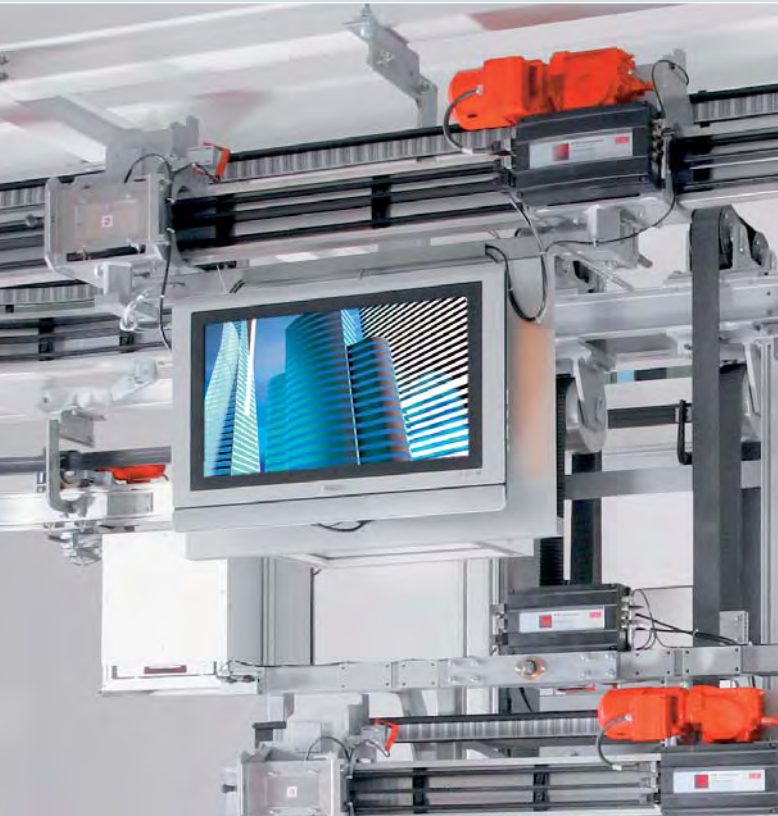
| System modules  |  |  |  |  |   |
|---|--|--|--|--|---|
|    |   |   |   |   |    |
| <b>EMS – Electrified monorail system function classes</b>   | <b>Energy transfer (contactless or with contact)</b>   | <b>Drives</b>  | <b>Information transfer and control technology</b>   | <b>Software</b>  | <b>Services</b>   |
| <ul style="list-style-type: none"> <li>– EMS advanced for light loads or</li> <li>– EMS customized for heavy loads</li> </ul> | <ul style="list-style-type: none"> <li>– Contactless with MOVITRANS® or</li> <li>– with contact with conductor rail</li> </ul> | <ul style="list-style-type: none"> <li>– Standard servo gear units and motors</li> <li>– Decentralized drive technology with MOVIMOT® gearmotors with integrated frequency inverter</li> </ul> | <ol style="list-style-type: none"> <li>1. MOVIPRO® vehicle control</li> <li>2. MOVIPRO® switch control</li> <li>3. MOVIPRO® segment controller</li> <li>4. MOVIPRO® LSI operator panel</li> <li>5. MOVIPRO® information transfer components:               <ul style="list-style-type: none"> <li>- Access point</li> <li>- Radiating cable</li> </ul> </li> </ol> | Configurable system software MOVIVISION®: <ul style="list-style-type: none"> <li>– Basic functionality of MOVIVISION® and</li> <li>– Extended functionality of MOVIVISION® for EMS applications</li> </ul> | <ul style="list-style-type: none"> <li>– Planning</li> <li>– Application or system configuration</li> <li>– Startup support</li> <li>– Installation monitoring</li> <li>– Service and system maintenance with CDS® – Complete Drive Service</li> <li>– Distribution logistics, e.g. DriveGate</li> <li>– Product training at the DriveAcademy</li> <li>– Internet portal for optimum project communication of all persons involved</li> </ul> |



The EMS application system solution for overhead trolley systems make for implementation of variable and efficient conveying systems with high productivity and availability both for heavy load and light load applications.

## Requirement: Heavy or light load?

The requirements on the functions of a conveying system are similar in many industry sectors, such as the automotive or food industry, wood processing or logistics industry, e. g.



- supply of raw materials,
- necessity to connect individual production steps,
- take on buffer functions,
- ensure that the products are transferred or removed, and
- sequencing/sequence of the transport material.

The weight of the loads to be transported differ in the individual industry sectors. The weight specifies the load requirement on the electrified monorail system to be used. This is the reason why SEW-EURODRIVE offers two function classes for the EMS application system solution:

### EMS advanced

Developed and designed for operation in material handling applications with light loads (up to 1 ton per vehicle), one travel axis and one auxiliary axis for bearing the load (hoist/rotational axis). This version comes equipped with a standardized and C1 compliant vehicle control with integrated frequency inverter.

### EMS customized

Developed and designed for heavy loads and multi-axis applications. The vehicle control is a highly flexible system which is configured to match the requirements of the application. Virtually any task can be solved by using all modules from the modular system.

### Operating principle

The intelligent application solution EMS for decentralized operation includes decentralized components independent of the function classes, such as TES decentralized power supply, segment controller, LSI operator panel, vehicles and switches. In contactless supply systems, the ETHERNET data transfer takes place using a radiating cable (WLAN). The energy can either be transferred with contact via conductor rails or contactless via a MOVITRANS® line cable.

## EMS advanced and EMS customized at a glance

|                                       | EMS advanced   | EMS customized  |
|---------------------------------------|--|---|
| Energy supply                         | Contactless or with contact via conductor rail   |   |
| Contactless communication             | Continuous   |   |
| C1 standard compliant                 | Yes  | No  |
| Diagnostics                           | Continuous   |   |
| Material flow                         | Intelligent:<br>Just in sequence and just in time  |   |
| Classification and field of operation | Light load <ul style="list-style-type: none"> <li>– Material handling applications in the light load range</li> <li>– one travel axis</li> <li>– one additional axis for bearing the load (e.g. hoist/rotational axis)</li> <li>– Material flow optimization</li> <li>– Loads up to 1.0 t</li> </ul> | Heavy load <ul style="list-style-type: none"> <li>– Heavy load and variable multi-axis applications</li> <li>– Loads up to ca. 4.0</li> <li>– Vehicle control is very flexible; can be configured according to application-specific requirements</li> </ul> |
| Total performance per travel drive    | 750 W  | 11.0 kW (for all axes)  |
| Axes                                  | 1 + 1 (MOVIMOT®)   | 4   |
| Positioning                           | Continuous and configurable by means of 1 absolute encoder system on the track   | Continuous and configurable by means of one to several absolute encoder systems on the track and on the vehicle   |
| Distance between the vehicles         | Variable   |   |
| Housing of the vehicle control        | C1 compliant (unmodifiable)  | MOVIPRO® modular system   |
| Number of inputs and outputs          | 4 inputs and outputs, freely configurable  | Up to 24 inputs and outputs, freely configurable  |
| Safety technology                     | No   | Optional  |
| Function level                        | Complex (breakpoints, production data memory, etc.)  | Komplex (breakpoints, production data memory second controlled axis/hoist, etc.)  |
| MOVIVISION® software Components       | <ul style="list-style-type: none"> <li>– Firmware advanced</li> <li>– Server/client</li> <li>– Software package</li> </ul>   | <ul style="list-style-type: none"> <li>– Firmware customized</li> <li>– TecUnit</li> <li>– Server/client</li> <li>– Software package</li> </ul>   |
| Track control                         | Decentral segment controller   |   |
| Configuration and diagnostics         | <ul style="list-style-type: none"> <li>– Via client window</li> <li>– LSI operator panel</li> </ul>  |   |

## The system modules of the EMS application system solution at a glance

### Energy transfer (contactless or with contact)

#### MOVITRANS®

##### contactless energy transfer

The state-of-the-art MOVITRANS® contactless supply system from SEW-EURODRIVE works on the principle of inductive energy transfer. In this system, electrical energy is transferred without contact from a fixed conductor to one or more mobile consumers. U-shaped pick ups around the line cable induce current into the mobile converter. The electromagnetic connection is made via an air gap and is not subject to wear, making it maintenance-free.

Components of the MOVITRANS® system for stationary and mobile energy transfer:

- TES decentralized power supply
- THM pick-up
- TLS line cable
- Fastenig profiles for the TIS line cable
- TPM mobile converter

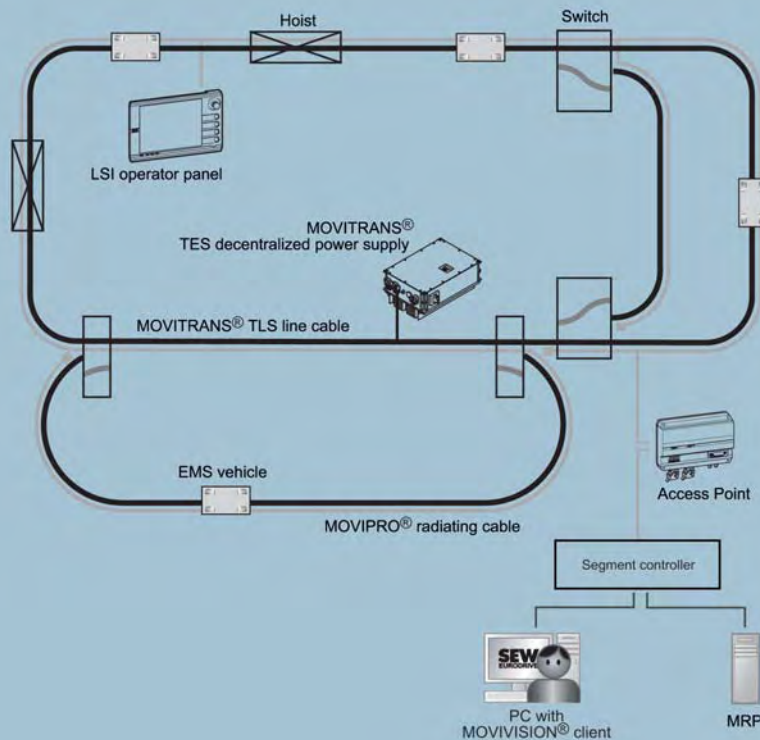
As option, a safety circuit of the energy transfer is available centrally in the control cabinet and/or decentrally in the field.

Another big advantage: this type of energy supply does not cause any pollution and is resistant to external pollution.

##### Sliding contacts for energy transfer

Energy transfer via sliding contacts means the mobile consumers are supplied with power via an insulated conductor rail. The conductor rail is protected against contact according to VDE 0470 and provides degree of protection IP21. The current collectors are usually made of high-impact plastic and stainless materials, and the current is collected via carbon brush.

System layout with stationary system components



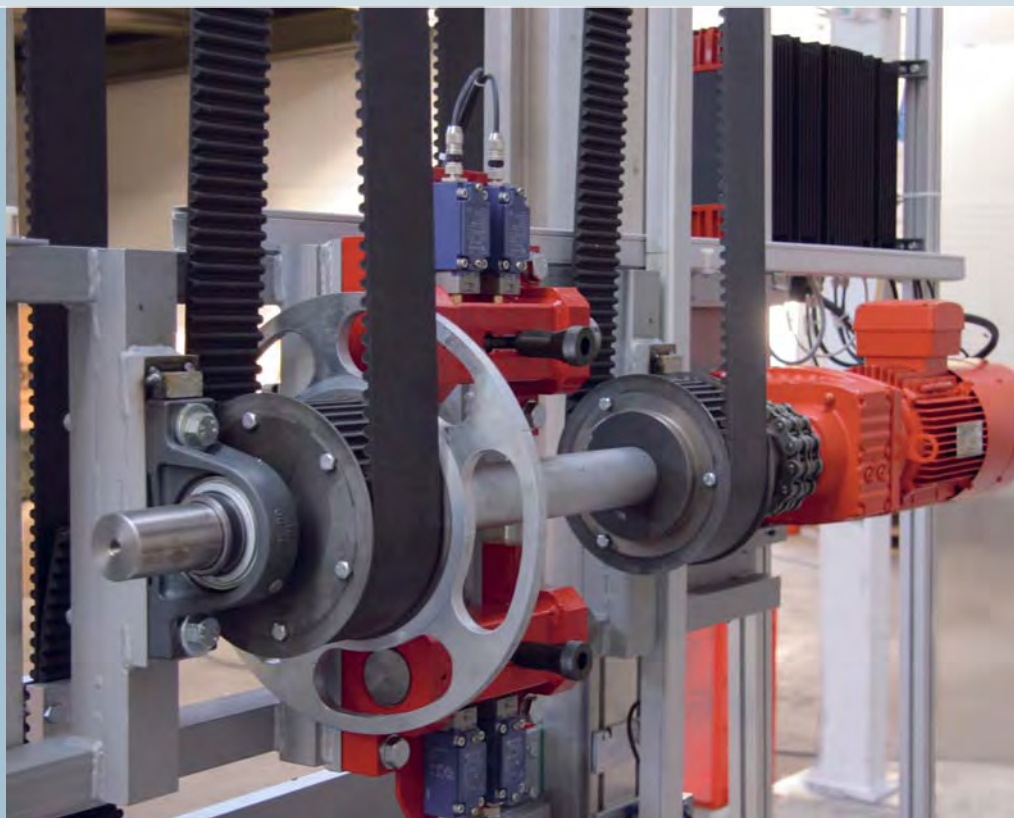
## Drives

SEW-EURODRIVE offers millions of combinations. The modular principle of SEW-EURODRIVE is based on the mechanical and electromechanical drive components. The OHT drives for light and heavy loads also come from this unexhaustable modular system as well as all other

necessary gear units and gearmotors of the EMS application system solution, such as

- Standard servo gear units and motors
- Decentralized drive technology with MOVIMOT® gearmotors with integrated frequency inverter

The standard components from the modular system offer another decisive advantage in addition to a high level of quality and reliability, high efficiency and reproducible stopping accuracy: they are available at any time.



## Information transfer and control technology

### 1. MOVIPRO® vehicle control

The vehicle control is integrated in the vehicle, which means it moves along with it, and maintains a permanent connection with the higher-level system. The MOVIPRO® vehicle control PHE is available in different versions depending on the function level and type of energy transfer:

- MOVIPRO® PHE for EMS advanced:
  - Robust housing with degree of protection IP64 and C1 compliant
  - Integrated 3x7 segment display
  - 4 inputs and outputs, freely configurable, optional CAN
  - connection via industrial plug connector
  
- MOVIPRO® PHC for EMS customized:
  - Application-specific project planning, individual selection of modules/components
  - Robust housing with degree of protection IP65
  - Integrated 3x7 segment display
  - 24 inputs and outputs, freely configurable, optional CAN
  - connection via industry plug connector

Each vehicle control always contains components for communication with the segment controller, a control for the vehicles and a drive electronics for the drives. The MOVIPRO® vehicle control PHE/PHC executes commands, can position itself and saves target and route information as well as production data.

### 2. MOVIPRO® switch control

The MOVIPRO® switch control PHE implements short switching times, precise end positions and low-wear operation thanks to soft ramps. The modular principle applies to switch control as well. MOVIPRO® switch control is based on the same core components as for the PHE vehicle control independent of the function level of the entire system. The result: perfect coordination and communication. The MOVITRANS® system supplies the switch control with power and the radiating cable allows for connection to the communication. Control of the switch is based on the configurable target and route information of the vehicle or on external command.



Vehicle control  
MOVIPRO® PHE advanced  
powered by MOVITRANS®



MOVIPRO®  
operator panel LSI

### 3. MOVIPRO® segment controller

The segment controller implements the automatic track control, system managements and data transfer. Configured with the MOVIVISION® configuration interface, the segment controller takes on the following tasks:

- Track management
- Track operation
- Track section control
- Coordination of vehicles and switches
- Management of digital inputs and outputs
- Energy saving management for MOVITRANS®
- Connecting the system via ETHERNET
- Configuring the communication with adjacent systems of higher-level systems
- Communication with adjacent segment controllers
- Distribution of data, such as parameters, production and component data, into the system components, for example vehicles

### 4. MOVIPRO® operator panel LSI

The operator panel is the control center of the EMS application system solution: As operator and visualization system with integrated touch screen, the panel enables

- Visualization of the system using data from the segment controller
- On-site diagnostics of the system
- Selecting the operating mode
- Operating the system components manually
- Acknowledging faults

### 5. MOVIPRO® information transfer components

- Access Point  
The access point enables the exchange of wire-bound (ETHERNET) and wireless (WLAN) data.
- Radiating cable  
The radiating cable, which is a coaxial cable

with slotted shield, is installed along the track and provides the system with continuous, contactless communication. The opening in the cable causes a limited radio field around the radiating cable (without shadowing and reflections). The advantage of this concept is that it is not necessary to illuminate complete halls and that there is no interference with other systems. In this way, information transfer

via radiating cable ensures reliable and uninterrupted radio connection to the vehicles as well as fault-free transfer of process data from and to the vehicles.

The MOVIPRO® system uses WLAN in the frequency range from 2.4 to 2.4835 GHz for contactless communication.

## Software

### **Configurable system software MOVIVISION®:**

#### **Parameter setting instead of programming**

The intelligent and user-friendly MOVIVISION® system software offers the following advantages: Preconfigured drive functions allow for projecting, configuring and starting up a system without programming. MOVIVISION® is the configurable system software for decentralized units of the new generation by SEW-EURODRIVE. It has an intuitive graphic user interface and functions that considerably reduce the effort required for project planning, startup and maintenance.

The MOVIVISION® system module is always part of an application system solution from SEW-EURODRIVE. Following a description of

the basic functionality of the MOVIVISION® system software and extended functions specifically for EMS applications in material handling.

#### **Basic functionality of MOVIVISION®**

MOVIVISION® is a configuration and diagnostics system with a central database (SRV) based on a client-server architecture. The central database contains all data for initial startup, unit replacement, parameter changes and diagnostics.

The server manages the central database (data management) and makes access to the data possible by means of various clients (CL). For example, one client allows for initial startup, another one for data access for parameter setting and monitoring, or unit replacement. Parameters are changed in the database only.

#### **Extended functionality of MOVIVISION® for EMS applications**

The modified parameters are distributed automatically to all stationary and mobile system components via the segment controller (SC).

Stationary system components:

- Central PC or laptop (SRV/CL)
- Segment controller (SC)
- Operator panel (LSI)
- Switch control (SWC)
- Decentralized power supply (TES)
- Access point (AP)
- Digital inputs and outputs (DIO)

Mobile system component:

- Vehicle control (VH)

#### **Advantages of MOVIVISION®**

- Software replaced hardware (no need for physically adjusting the tracks and no sensors along the travel section)
- Flexible creation of track segments via software
- Manual operation of system components
- Simplified startup procedure of the system
- Functions are modified or added, only by parameter setting. The hardware remains unchanged.
- Central data management

## Services

The competence of SEW-EURODRIVE is not only characterized by technically highly developed and powerful application system solutions. The competence is based on the employees who plan, configure and support these solutions. Right from the beginning.

System manufacturers and operators opting for application solutions from SEW-EURODRIVE have the advantage of cooperating with a competent and powerful partner who actively contributes to the economic success also after startup by providing services, product training and personal commitment.

### The full service of an application system solution from SEW-EURODRIVE includes

- Planning
- Project planning for the application or system
- Startup support
- Installation monitoring
- Service and system maintenance with CDS® Complete Drive Service
- Distribution logistics, e.g. DriveGate
- Product training at the DriveAcademy
- Internet portal for optimum project communication of all persons involved

