SEW EURODRIVE

MOVITRANS®

Contactless energy transfer system

Interview 1: Factory automation // Smart factory

Designed for simplicity and optimized installation

MOVITRANS® contactless energy transfer system makes production facilities modular and flexible

Everyone is familiar with those electric toothbrushes that sit in their stands and charge wirelessly, just like magic. Smartphones can also be charged using suitable contactless charging points.

This technology has rapidly become a standard fixture in the latest generation of cars and even mobile homes. Simply place your cell phone in the tray and not only will the battery charge, but the mobile device will also become integrated into the vehicle electronics – all without the owner needing to find the correct cable or socket.

Contactless energy transfer has long been part of industry, too, and is one of the cornerstones of cutting-edge production. MOVITRANS® is a key element that supplements the comprehensive portfolio of Bruchsal-based drive and automation specialists SEW-EURODRIVE. For more than two decades, the company has been one of the most important leading suppliers of this technology for industrial use.

In an interview, Managing Director Mechatronics Innovation at SEW-EURODRIVE, Dr. Hans Krattenmacher, reveals the secret behind the MOVITRANS® success story and how that story will develop in the future.

Dr. Hans Krattenmacher,
Managing Director Mechatronics Innovation,

has been with SEW-EURODRIVE for over 20 years. Right from the start of his time with the company, he came into contact with the MOVITRANS® contactless energy transfer system – which was still in its infancy at the time.

He experienced up close and personal how this "very, very new technology" at the time began to take off and ultimately scored its initial success in the field.

SEW-EURODRIVE provides its contactless energy transfer system under the brand name MOVITRANS®. How valuable is MOVITRANS® in production systems?

MOVITRANS® is a vital infrastructure component for factory-automation. More than anything else, the new approaches associated with modular factories and discussions relating to Industry 4.0 are leading to a desire for greater modularization and flexibility in factories. Of course, this includes the infrastructure and more specifically the energy infrastructure. When it comes to the electronic, energy infrastructure, thoughts generally turn to permanent cables and fixed installations. However, this means there is a lack of flexibility.

It is precisely here that, through MOVITRANS®, we offer a simple way of achieving the necessary energy flexibility in the infrastructure that makes it possible to implement modular concepts. These concepts are primarily associated with mobile vehicles, including our customers' AGVs, plus, more recently, mobile assistants of many different kinds, such as those we develop and offer. These will gradually replace the old fixed installations. The new flexibility this is bringing to transport concepts also requires new flexibility to be brought to the energy supply. MOVITRANS® offers everything necessary and is becoming increasingly important as a component of the energy infrastructure in smart factories, in line with Industry 4.0.

What specific uses was MOVITRANS® developed for? What are the areas of focus?

Our primary focus is on factory automation – that is SEW-EURODRIVE's core competence. We find ourselves facing a wide variety of requirements, particularly when it comes to the on-site circumstances for the installation. In some cases, it is possible to rip up the floor of the facility to lay cables. In other cases, this is an absolute no-no. This is why we have given special priority to flexibility in terms of installation, offering many different approaches. **During the development process, we also focused on the different ways energy is to be transferred. For permanent power supply during operations, we offer line cable systems in the form of MOVITRANS® line.**

However, if the aim is to move freely around the room rather than following a track, our specially designed point charging systems from the MOVITRANS® spot range and energy storage devices come into play. These point charging systems provide the freedom necessary to meet all the requirements we have become familiar with over the last few years from the modular smart factory. Thanks to MOVITRANS®, customers can either move their vehicles along a fixed track, continuously feeding them with power, or charge them occasionally at charging points and then navigate freely around the room as needs dictate.

> **"Even in such seemingly exotic projects as rail technology, we can see potential applications for MOVITRANS®. That gives some indication of how diverse our concept is. SEW-EURODRIVE offers a comprehensive, well thought-out system that has a wide range of applications far beyond purely industrial automation."**

MOVITRANS® line

How long has SEW-EURODRIVE's range included contactless energy transfer? And what are the special features of the new developments MOVITRANS® line and MOVITRANS® spot?

When I joined SEW-EURODRIVE over 20 years ago, I was very happy to have my first contact with MOVITRANS® during my induction period. At the time, this was a completely new, exciting technology. It goes without saying that the focus back then was still on mastering this technology itself, everything that would be needed and how the concept could be implemented in the field. Our experiences during these 20 years have been poured into our next generation of MOVITRANS®. This includes recognition of the fact that customers need quite different systems, depending on their application.

With MOVITRANS® line, which is designed for applications where vehicles move along a track on a predefined path, and are therefore permanently supplied with energy, we have developed a system where the vehicle functions with very little energy storage. After all, they are almost constantly connected with the line cable, though they can go off-track occasionally thanks to short-term energy storage. As a result, customers can construct their mobile system with optimized weight and costs.

> **"For MOVITRANS®, we have designed everything for simplicity and optimized installation. Thanks to our optional on-floor system, customers can simply dismantle their MOVITRANS® installation, then put it back together according to their needs."**

Over the years, however, we have increasingly found there is a need for very flexible infrastructure layouts. It goes without saying that factory layouts where vehicles are to move freely, without being bound to a specific route, need a different concept. In this case, larger energy storage units must be mounted on the vehicles. At "spots" – the equipment that gave MOVITRANS® spot its name – the vehicles can charge up these energy storage units in a short time, and then move freely around the room again. Both these systems perfectly meet the needs of factory automation.

Does installing the cables and field plates in the floor not involve a complex process?

In the past, we actually cut deep slits in workshop floors to lay cables. That always caused unease, especially among the workshop foremen. We didn't make ourselves popular. Nevertheless, this is still a sturdy, though rigid, design. As a result, we used wedge-shaped cables to develop optimized systems that have really, really reduced the impact on the workshop floor and made installation a lot easier. Everything is designed for simplicity and optimized installation.

What's more, we have developed an on-floor system for those customers for whom any changes to the workshop floor are completely out of the question. This system uses the type of plastic industrial flooring you see at trade fairs or in workshops. We put the MOVITRANS® system into this tried-and-tested floor material. As a result, customers can now quickly and easily lay the system on their workshop floor. In addition, this also means customers are highly flexible should they ever need a different solution. All they have to do is dismantle the industrial flooring and then put it back together to meet their new needs.

MOVITRANS® spot

When it comes to installation, it's a perfectly straightforward system that is designed precisely to the needs of the customer, then. How about startup?

This was the next thing we took a closer look at. After all, installing line cable, for example, involves an inductance that has to be compensated. This always used to be a little complicated, because special measuring equipment was needed and the procedure was very complex and not particularly practical. We recognized that, too, and made things a whole lot simpler. We developed compact decentralized supply electronics and a fine compensation box for this purpose. These boxes can automatically measure inductance and compensate it in just a few steps.

Customers therefore no longer need expensive, separate measuring equipment, since the technology is integrated into our MOVITRANS® solution. It goes without saying that the system as a whole became totally straightforward as a result. In addition, when it comes to the startup tools, planning tools and even training tools, we significantly expanded the technology, which made it possible for us to generate a super-simple system that truly extends from planning to installation.

> **"The desire for free movement is huge, and continues to grow. With MOVITRANS® spot, we have now created the energy supply situation for this."**

What impresses you most about MOVITRANS®?

I'm a trained energy technician, after all, so the subject of contactless energy transfer is well within my comfort zone. What fascinated me about MOVITRANS® from the outset was the incredible diversity of uses for such a system – everything from shuttle systems and our AGVs to applications such as the panorama train that we equipped in a theme park. One day you can be talking to an automaker from the Far East about how it can charge its cars without using cables, and the next you are visiting a train manufacturer to discuss how its trains or a magnetic levitation train can be charged contactlessly when they arrive at a station. And this versatility and wide range of applications are as fascinating for me today as they have always been.

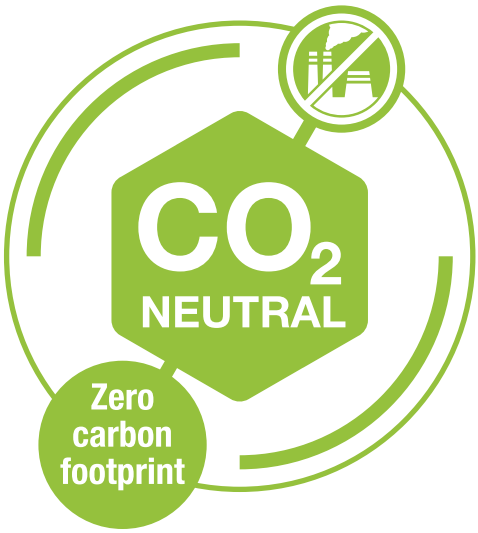
You can see it in your everyday life – maybe you use an electric toothbrush. You might almost say that is MOVITRANS®. **Our whole life, which is becoming increasingly electrified, is influenced by how we can easily transfer energy – electrical energy – to other systems.**

> **“We are now experiencing for ourselves what it means for this and the next generation to be able to make energy available in a good, clean way. That is what’s exciting about MOVITRANS®. The technology behind it is part of the energy revolution in the infrastructure all around us.”**

Is there any particular highlight that you associate with MOVITRANS®?

We already come across examples of MOVITRANS® – figuratively at least – incredibly often in our everyday lives, without even noticing it. When you put your smartphone in a charging tray to charge, that’s a kind of MOVITRANS®. The same applies to your toothbrush. What’s more – and this is the wonderful, fascinating thing for me – when we use MOVITRANS® in the industrial sector, the mobility sector and in our vehicles, we are using a technology and physics that have been around for well over 100 years. We have now developed these to such an extent that they are not just finding their way into our everyday industrial work.

For me, the panorama train in Europa-Park is a perfect example of rethinking and redesigning energy infrastructures. After all, this train was previously operated using a combustion engine. We are now experiencing for ourselves what it means for this and the next generation to be able to make energy available in a good, clean way. That is what’s exciting about MOVITRANS®. MOVITRANS® is part of the energy revolution in the infrastructure all around us.



> **“Surely everyone has realized by now that climate change is real and we urgently need to change something. We will therefore do our part, too, and focus strongly on the subject of the ‘Green Deal’ in the coming years.”**

You raised the subject of clean energy. There is hardly another subject that gets as much attention as environmental and climate protection at the moment. Do you think that MOVITRANS® can make a major contribution for the future in this regard?

That's right. We have two infrastructure components that are perfect for cutting-edge energy management – first, there is MOVITRANS®, and second, we have Power and Energy Solutions, or PES, from our MOVI-C® modular automation system. This is one of our first approaches for our contribution to the Green Deal, something that is getting a lot of attention at present. The European Union is already creating requirements on this subject.

We are already seeing the consequences of climate change in all the storms, floods, heat waves and forest fires – I think everyone must have realized by now that it is real and we urgently need to change something. We will therefore do our part, too, and focus strongly on the subject of the 'Green Deal' in the coming years.

This is why we are developing and working on this portfolio of MOVITRANS®, Power and Energy Solutions, etc., because these are all infrastructure components that are simply necessary for reaching the goal of CO_2-free energy supply. It is also why we will continue to invest systematically and keep driving the system forward. And it is the reason I am convinced that MOVITRANS® will become far more widespread than we can imagine now.

> **"We really are systematically focusing on the future and aim to design factories not only along Industry 4.0 lines in terms of automated communication, but also with energy networking."**

Find out more about MOVITRANS®:

Interview 2: Charging vehicles inside and outside production facilities
Interview 3: Energy-autonomous factories and energy-autonomous homes

On the corporate website:

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