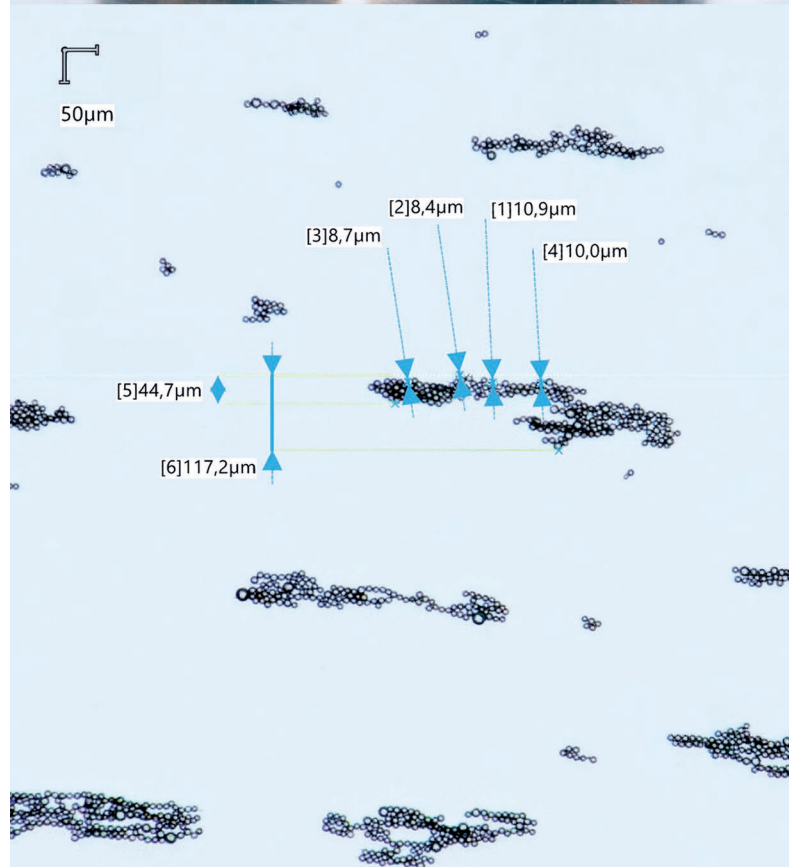
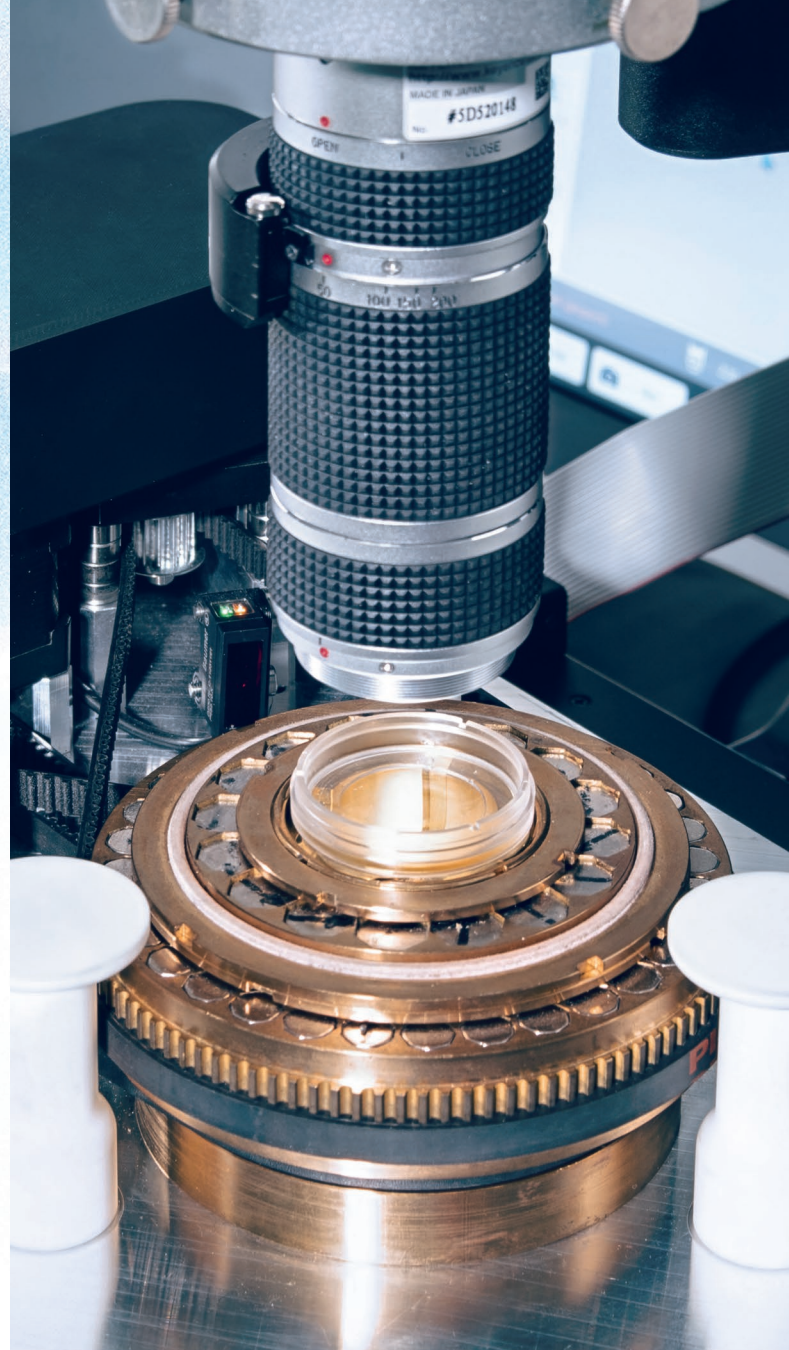
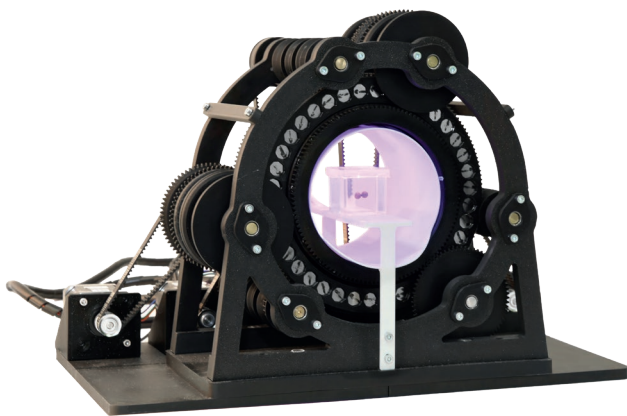


MAGNETIC PARTICLE MOVER

Precise, Reproducible and Contactless Control of the Motion of Magnetizable Particles

- 2D/3D particle control
- real-time software control
- impact on research and production



Contactless, Reproducible Control for Research, Diagnostics and Microtechnology

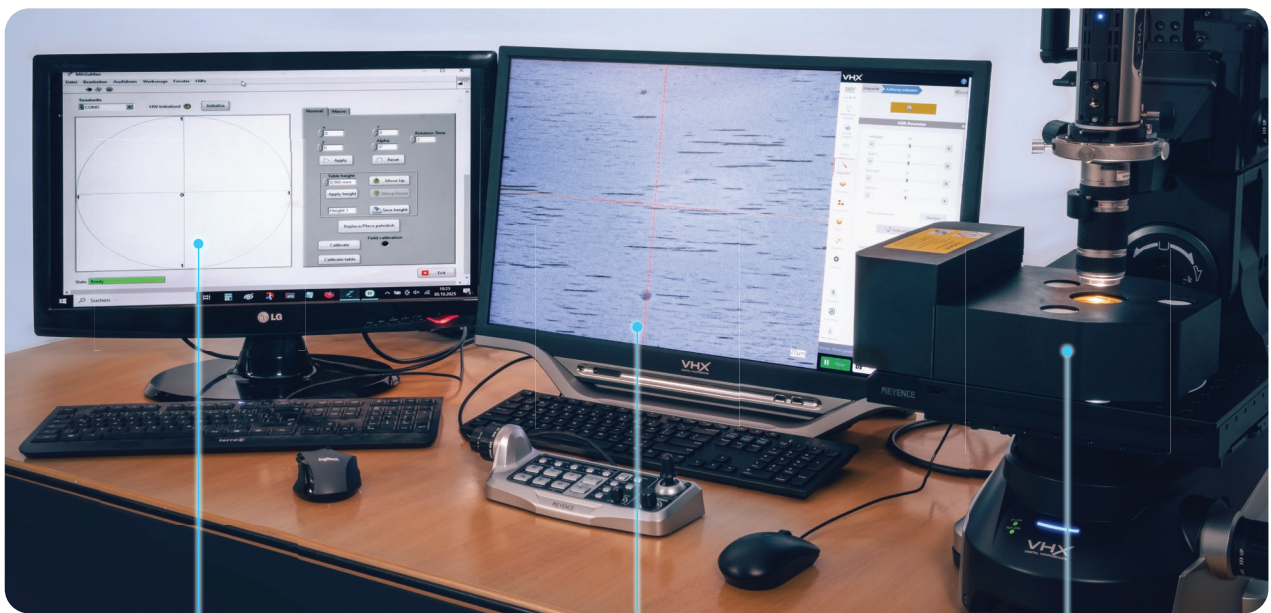
The controlled, contactless motion of ferromagnetic nanoparticles is becoming increasingly important in many fields of research and applications. These include life sciences, biomedicine, laboratory processes and micro- and nano-robotics. Wherever smallest particles need to be moved precisely and reproducibly without contact, new possibilities open up.

However, traditional mechanical manipulation quickly reaches its limits at the micro- and nanoscale. Dominant surface forces, limited installation space for actuators and the challenging task

of reproducibly positioning the smallest objects make precise processes difficult. Contactless methods are therefore of great interest, especially for handling sensitive samples or controlling numerous particles simultaneously.

This is where our 2D and 3D manipulators for magnetizable nanoparticles as well as micro- and macro-magnetic objects come into play. The systems enable precise and reproducible control of motion and positioning sequences in two or three dimensions—contactlessly and based on precisely generated magnetic fields and field gradients.

What You Can Do with Magnetic Particle Mover



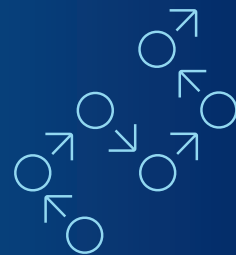
Program

Define and program particle trajectories with the supplied software.



Observe

Monitor particle motion in real time using a digital microscope.

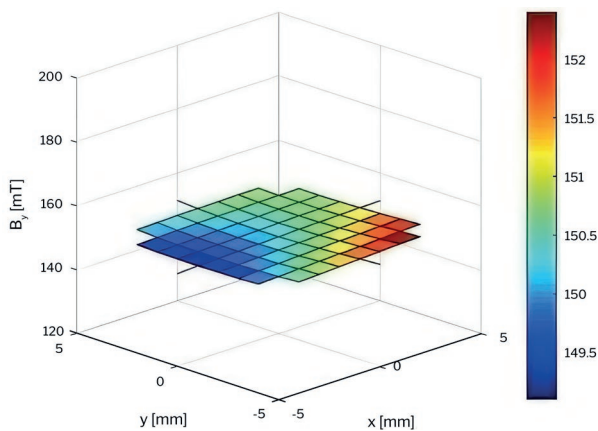


Move

Precisely move magnetizable nanoparticles as well as micro- and macro-scale magnetic objects.

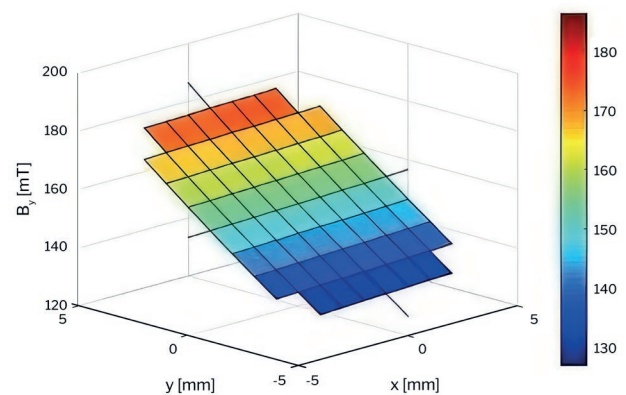
Principle

The technical principle is clear and powerful. The system generates superimposed magnetic fields and field gradients. This is achieved by using Halbach dipole and quadrupole arrangements of ring-shaped magnetic subsystems. The amplitude and direction of the magnetic field gradients can be adjusted precisely. Magnetized particles can thus be moved and positioned with precision in a controlled manner. This movement can be visualized, observed and documented using a digital microscope. The included software provides real-time control.

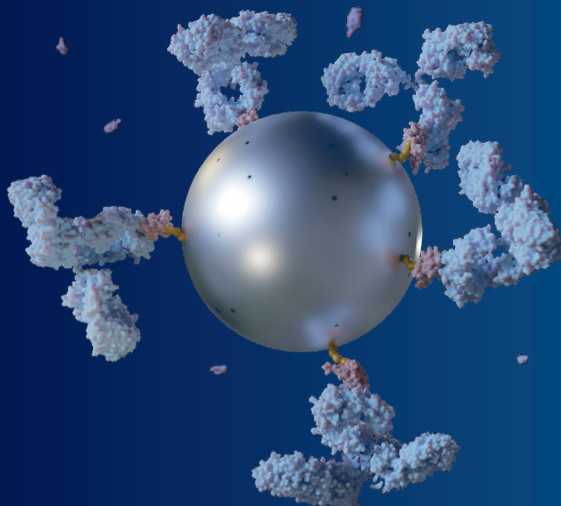


Homogeneous magnetization field generated by the dipole magnet ring at compensating positions of the two quadrupole magnet rings.

For research and development, this means much more than just motion control. The technology lays the groundwork for reproducible experiments, automatable workflows and new experimental approaches. It enables researchers to precisely define particle movements, fine-tune experimental conditions and implement processes without physical contact.



Magnetic dipole field overlaid with the maximal field gradient created by turning both quadrupole rings in the same orientation. This configuration induces the maximal magnetic force on magnetized particles.



Key Application Areas

Cell biology: Contactless manipulation of individual cells for tissue engineering and stem cell research.

Magnetic separation: Separation of cells, pathogens or biomolecules using magnetically labeled nanoparticles on a chip.

Microrobotics: Control of therapeutic microrobots for minimally invasive applications.

Microassembly: Precise positioning and assembly of tiny magnetic components.

Lab-on-chip development: Integration of magnetic actuators for complex microfluidic systems.

Our 2D and 3D manipulators create new opportunities for universities, research institutions and technology-oriented companies. They help them address new research questions, perform more precise experiments and develop innovative products and processes.



The "Magnetic Particle Mover" 2D manipulator enables the precise and repeatable movement of magnetizable particles in a plane.



The "3D Guider" 3D manipulator extends the contactless control of magnetizable objects to three-dimensional space

Get in Touch

Ready to move beyond contact-based control? Talk to our team and discover what contactless magnetic control can do for your application.

Your dedicated contact person is here to provide you with the information you need.

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