



## SELF-STABILIZING MICROSCOPE ARTICULATING ARM

Our customer is a leading manufacturer of surgical microscopes worldwide for the medical technology sector. In line with the current trend of exoscopy (high-definition digital imaging via an external monitor instead of using eyepieces), the company would like to develop a new, simple, and intuitive microscope for medical diagnosis and the treatment of various diseases.

### Conception, construction, and assembly of a functional model

The first task was to define the kinematics for a mechanically operated microscope articulating arm. Then, the team constructed a gimbal arm with the required range of motion and degrees of freedom as an initial functional model. The individual mechanical parts were procured and pre-assembled by konplan. At the customer's site, the microscope was attached, and the pre-assembled arm was balanced and adjusted. Some of the challenges included:

- ensuring that the system is properly balanced,
- guaranteeing and adjusting for a smooth and consistent operational feeling throughout the range of microscope movement as well as
- the possibility of intuitively locking the individual axes of movement.

In a further step, the partial motorization and axes gear selections were designed for the smallest possible space and implemented as a prototype.

### Prompt wet lab tests using a minimal viable product (MVP)

konplan added a console for the video electronics and the appropriate monitor carts to create a complete MVP which allowed doctors to promptly test the complete system in the wet lab.

The test results showed that the balanced and damped articulating arm allows precise positioning of the microscope using intuitive overhead operation for fast and ergonomic targeting of the relevant site (surgical area) using the front-mounted monitor.

Thanks to the work done by konplan, the product management team was able to make informed decisions concerning further development of the product.

### Result

- MVP construction for clinical surgical testing
- Direct user feedback from doctors/surgeons
- Quickly from concept to hardware

### Methodology & Technologies

- Construction in CREO
- Drive technology
- Prototype construction

### Scope of Services

- Conception & Construction
- Hardware procurement, assembly, and delivery



12 months



3 employees – konplan  
2 employees – customer



Analysis & idea generation,  
conception, development

