

# Michelangelo Hand with active rotation – AxonRotation

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## “Compensating movements are reduced to a minimum”

However, until recently the unaffected hand was needed in order to move the Michelangelo Hand into the desired position at the wrist unit. Now the active AxonRotation allows the prosthetic hand to be rotated electrically using myosignals. “This functionality assists users in numerous bimanual (two-handed) activities in everyday life and at work, making it another important component in the Axon-Bus prosthesis system,” says Martin Wehrle, responsible Product Manager at Ottobock. “With the flexible wrist joint mode of the AxonWrist, the various grip types and the addition of the active AxonRotation, compensating movements are reduced to a minimum.”

The active rotation has a modern, proportional control so the system is sensitive and functions exactly with the muscle signals. Proportional control is possible for both movements, the gripping function of the Michelangelo Hand and the rotating movement of the hand.

The neutral hand position was also included in the active rotation feature. A neutral hand position is already integrated in the Michelangelo Hand today – when the user relaxes the muscle and thus reduces the myosignal, the hand automatically moves to a relaxed, neutral position. With the active AxonRotation, the hand also turns back to a neutral position.

“This functionality must not be underestimated,” Martin Wehrle emphasises. “A person with two sound hands automatically knows what position the hand assumes in space, and what the position of each and every finger is. Before starting a movement, a prosthesis user has to visually check the position of the hand. Is the prosthesis rotated in or out? Is the hand open or closed?” With the neutral hand position of the Michelangelo Hand, the user automatically knows what the starting position is. This reduces the concentration required while grasping and makes controlling the prosthesis more intuitive. At the same time, a very natural and

The logo for "Quality for life", featuring two overlapping circles: a larger light blue one on top and a smaller green one on the bottom. The text "Quality for life" is written in white inside the green circle.

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symmetrical body posture results during relaxed standing and walking. "The prosthetic arm can swing freely while walking, and the hand does not accidentally rub against clothing in the area of the thigh," Martin Wehrle says.

## **Technical background**

Taking into considering the required installation height the AxonRotation is easy to integrate into any existing Michelangelo prosthesis system. Furthermore, the distal connector of the active AxonRotation corresponds to that of the passive rotation component. A straightforward electrical and mechanical connection of the Michelangelo Hand to the existing socket is therefore ensured. An additional transmission gear is integrated in order to reduce the fast rotational movement of the brushless motor into a suitable rotational speed of the prosthetic hand. The integrated position sensor then permits the automatic positioning of the AxonRotation in the neutral position. A mechanical ratchet as overload protection is integrated in the active AxonRotation as well, so that the prosthetic hand can also be positioned mechanically when needed.

## **Further information:**

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