

HAL-5 - Hybrid Assitive Limb

by Eric Butkus

HAL-5 offers a unique blend of rehabilitative potential and overall usefulness. Because of its elaborate control system, it is capable of almost limitless practical ability.

The suit is powered by a 100V battery pack, which is worn on the belt. The belt also holds the computer system which constantly monitors the user's pattern of motion and posture, and automatically makes adjustments, to ensure comfortability and ease of use. Actuators are located on the system relative to the wearer's hips, knees, shoulders, elbows and torso. The suit allows a user to pick up twice as much as they could without the suit, and has a two hour battery life at full load.

HAL-5 is controlled by myoelectric sensors, which sense the tiny electric impulses sent to the muscles surrounding the main joints which tell the muscles to contract or to relax. The suit harnesses these impulses and uses them to "steer" the suit. This means that if you were wearing the suit, and you wanted to pick something up that was heavy, just try to pick it up like you normally would, the suit automatically helps out. The suit has a promising future in the medical field. Due to the suit's unique calibration software and control modes, the suit can also be an indispensable aid for the disabled. For instance,

say a person who just suffered a stroke is trying to walk again, but the control for the left side of the person's body is damaged and needs to be rehabilitated, the suit can compensate for the weakened limbs and gradually lessen the assistance, allowing the user to gradually gain strength in the limb and rebuild the neuro-pathways in the patient and reestablish motor control. This suit can quite possibly one day be the foremost tool in physical therapy and in rehabilitation for spinal or stroke injury victims.



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