A portable system for closed loop control of the paralysed hand using functional electrical stimulation

SE Crook, PH Chappell

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A Portable and closed-loop system is described for the paralysed hand using transcutaneous electrical stimulation. It is implemented using a modest microprocessor which receives data from force sensors mounted in a glove on the hand. A display shows parameter values and a menu for the user to sequentially select control states. For the grip, the control loop is basically proportional plus a two stage integral response (gain adaptation). Eight channels can be accommodated in the stimulator. The system was evaluated with the help of a tetraplegic who managed to hold everyday objects in a stable grip.