



“ It was particularly rewarding to work on this project. While we take great pride in the electronics manufacturing services we provide, it’s even more fulfilling when the final product is improving the life of another person.”

**Agustin Mosquera,**  
Operations Manager  
ACDi

## MEDICAL REHABILITATION DEVICE IMPROVES PATIENT RECOVERY

ACDi partnered with a medical rehabilitation firm to assist in the development of a controller used in conjunction with a monitor for ergometers utilizing functional electrical stimulation (FES). The FES ergometer provides electrical impulses to stimulate muscles that have diminished nervous control and are at risk for atrophy, circulation issues, muscle spasms, and decreased range of motion.

The controller is easy to use and reports information from each use back to the database which is shared between patient and practitioner. This multiuse controller functions with five styles of ergometers, as well as having standalone capabilities. Ergometers exercise muscles through active therapy, where the muscles are able to perform work that they are unable to do without stimulation. The controller assists in monitoring the levels of stimulation administered to the patient.

The ergometer controller provides automatic progression with the patient’s physical improvement through a monitored database, shared between patient and practitioner.

### KEY FEATURES

- Five optional devices for receiving FES
- Ergometer-free capabilities
- FES is delivered consistently and reliably
- Smooth motion cycling
- Multiple muscle groups in conjunction with one another
- 140 mA, 200v
- 6 to 16 channels of stimulation
- Assists in control of muscle spasms
- Tones and balance muscles
- Varying levels of motor resistance
- Automatic speed control
- Automatic motor and stimulation control
- Fatigue detection
- Spasm detection

### APPLICATIONS

- Spinal Cord Injuries
- Muscle Weakness/Paralysis
- Stroke/Brain Injury
- Muscular Dystrophy
- Multiple Sclerosis
- Cerebral Palsy
- Chronic Pain



## WHY ACDI?

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For the development of the controller for the FES ergometer, ACDi was able to provide cost-saving program management and assembly services. These included:

### ENGINEERING DESIGN

ACDi's design engineers provided recommendations and modifications for the layout and design to ensure DFM, DFT, and DFA.

### PROCUREMENT SERVICES

ACDi provides complete materials management, ensuring on-time production through the MRP system and relationships built with local suppliers.

### PRODUCTION

ACDi and the customer worked together to meet production goals including cost, volume and schedule.

### INTELLECTUAL PROPERTY

ACDi provided the customer with configuration-managed documentation that ensures the customer will be able to maintain and manage the product.

### TEST AND QUALITY

ACDi tested all units for functionality at the board and systems level prior to shipment to ensure reliability.