## Demonstrate the fundamentals of processing electromyographic signals, using NI ELVIS platform and LabVIEW™ software.

INTRODUCE STUDENTS TO BIOMEDICAL ENGINEERING

Study of electrical activity of skeletal muscle tissue has many biomedical applications in diagnostic tools, kinesiology, or in control of prosthetic devices. The QNET Myoelectric board is ideally suited to teach and demonstrate the fundamentals of processing electromyographic signals, and introduces students to biomedical engineering. Designed exclusively for NI ELVIS platform and LabVIEW™ software, the board shows students how to apply the principles of electromyography to control a servo, using a variety of filtering and control techniques.
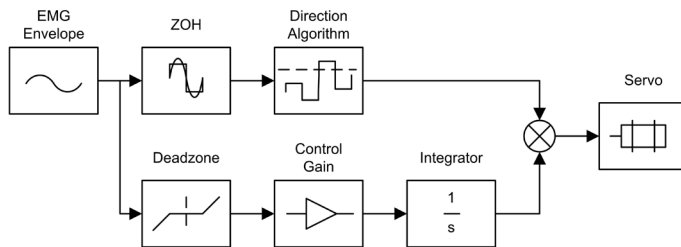
Myoelectric servo control algorithm

NI Part No. 781384-01

System specifications on reverse page.

QNET MYOELECTRIC WORKSTATION COMPONENTS

- QNET Myoelectric board
- NI ELVIS II or ELVIS II+[1]
- ABET-aligned course resources with comprehensive lab exercises, fully documented system models, and pre-designed VIs

HOW IT WORKS

The QNET Myoelectric board includes a two-electrode electromyograph with a grounding strap and a servo. The EMG signal produced by contracting the forearm muscles is measured and processed on-board, and used to control opening and closing of clamps on the servo, similarly to a myoelectric prosthesis. An optical isolation amplifier is used to amplify the electromyogram signal measured by the EMG electrode, remove noise, and isolate the power source from the user.

ACCELERATE DISCOVERY WITH NI ELVIS PLATFORM

The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) presents a modular teaching platform suitable for any engineering lab. Integrating 12 most commonly used instruments, including an oscilloscope, digital multimeter, function generator, dynamic signal analyzer in one device allows for quick and easy measurement, design and prototyping in an educational laboratory setting.
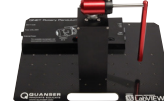
With a wide range of Quanser plug-and-play add-on boards for NI ELVIS, you can give students a great lab experience, and increases the value of your investment in NI ELVIS and LabVIEW software. Plus the comprehensive courseware reduces your lab planning time and allows you to focus on higher-value tasks.

For the full range of Quanser QNET boards, visit www.quanser.com

Teach Mechatronics

Teach Controls

Teach Power Electronics

The QNET Myoelectric board introduces students to biomedical engineering.

[1] Can be purchased directly from Quanser in selected regions. For details contact sales@quanser.com

SYSTEM SPECIFICATIONS

QNET MYOELECTRIC BOARD

On-board signal conditioning circuit and PWM

Electromyograph with opto-isolated electrode and grounding strap

Servo motor as prosthetic analog

FEATURES

- Electromyograph powered by two AA batteries, with opto-isolated electrode and a grounding strap
- Pulse-width controlled metal gear servo
- On-board signal conditioning circuit and PWM
- EMG signal monitoring at different stages in circuit
- Protective cover to shield the circuitry
- Built-in PCI connector for NI ELVIS II /ELVIS II+ for quick and easy lab setup

- Fully compatible with LabVIEW™
- Fully documented system models and parameters provided for LabVIEW™
- Comprehensive digital course resources aligned with ABET requirements
- Additional community-created resources available on www.QuanserShare.com

COURSEWARE TOPICS COVERED

- EMG signal processing and analysis
- Signal conditioning
- Fast Fourier Transform (FFT)
- Filtering

- Development of task-based servo control from processed electromyogram
- Zero-order hold
- Integral control

DEVICE SPECIFICATION

Servo motor operating range	4.8 – 6 V
Servo motor stall torque	3 kg.cm
Isolation amplifier recommended input voltage	± 0.2 V
Isolation amplifier output voltage range	1.29 – 3.8 V
EMG sensor analog output	± 5 V
EMG sensor gain	300 Hz
EMG upper cut-off frequency	500 Hz
EMG lower cut-off frequency	25 Hz

About Quanser:

Quanser is the world leader in education and research for real-time control design and implementation. We specialize in outfitting engineering control laboratories to help universities captivate the brightest minds, motivate them to success and produce graduates with industry-relevant skills. Universities worldwide implement Quanser's open architecture control solutions, industry-relevant curriculum and cutting-edge work stations to teach Introductory, Intermediate or Advanced controls to students in Electrical, Mechanical, Mechatronics, Robotics, Aerospace, Civil, and various other engineering disciplines.