




MyoWare™ Muscle Sensor (AT-04-001)

FEATURES

- *NEW* - Wearable Design
 - *NEW* - Single Supply
 - +2.9V to +5.7V
 - Polarity reversal protection
 - *NEW* - Two Output Modes
 - EMG Envelope
 - Raw EMG
 - *NEW* - Expandable via Shields
 - *NEW* - LED Indicators
 - Specially Designed For Microcontrollers
 - Adjustable Gain
- 

Low-cost electromyography - Validation against a commercial system using both manual and automated activation timing thresholds.

Heywood S¹, Pua YH², McClelland J³, Geigle P⁴, Rahmann A⁵, Bower K⁶, Clark R⁶.

Il sistema di riferimento è un sistema wireless
Telemetry DTS, Noraxon, Arizone, USA

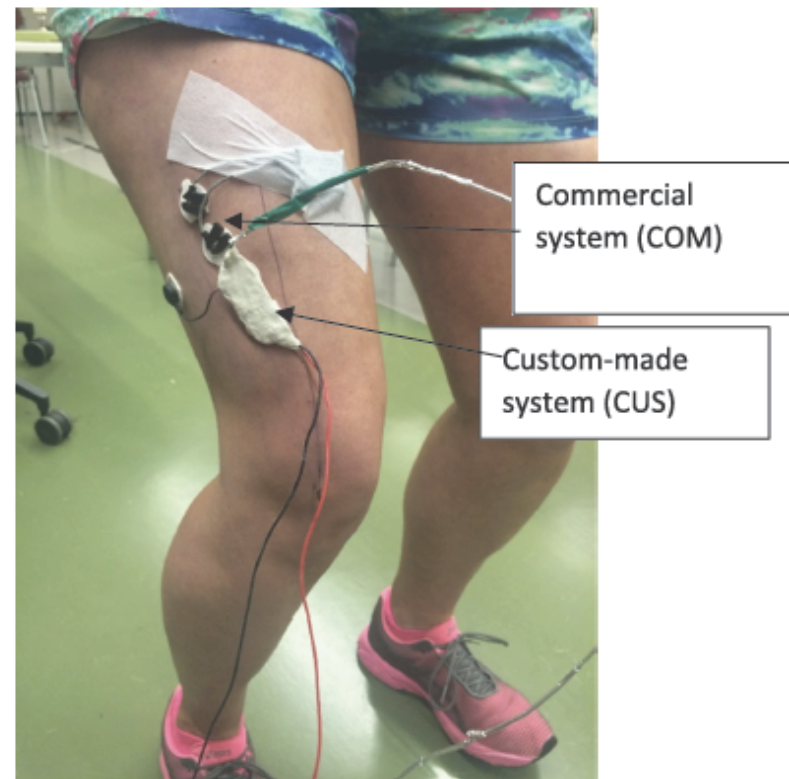


Fig. 1. An example of the electrode placement of the two systems along the fibres of Vastus Lateralis.

Low-cost electromyography - Validation against a commercial system using both manual and automated activation timing thresholds.

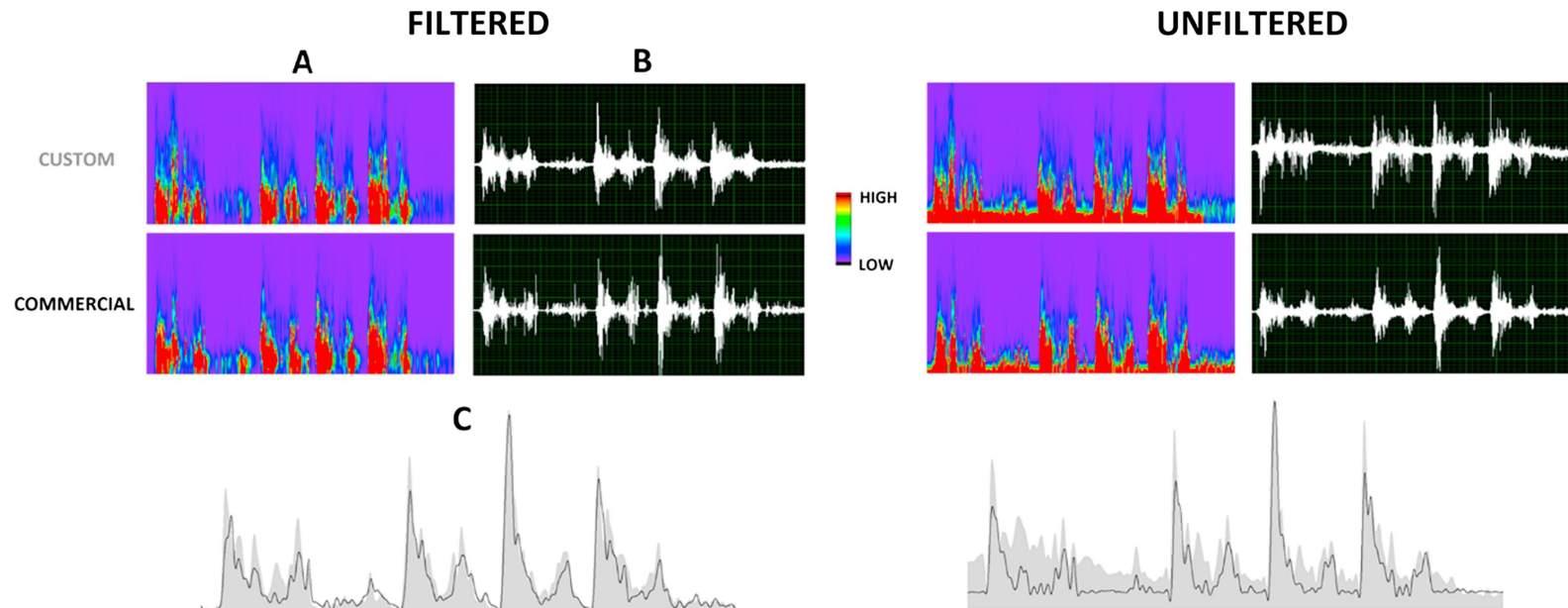
Heywood S¹, Pua YH², McClelland J³, Geigle P⁴, Rahmann A⁵, Bower K⁶, Clark R⁶.

Methodology for exercises tested.

Exercise	Instructions	Order
Squats	Slow speed (three seconds down to approximately 90 degrees of knee flexion and three seconds back to the starting position) Fast speed (one second down to 90 degrees knee flexion and one second to return)	Five trials of single exercises followed by five trials repeating three consecutive squats in a row
Step up (35 cm high)	Comfortable speed	Five trials of single step up and down followed by five trials repeating three consecutive repetitions of a step up and down in a row
Concentric active knee extension (90-0°)	Comfortable speed	Five trials of single repetition exercises
Isometric knee extension	Resisted isometric knee extension (in 80 degrees of knee flexion) in sitting	Two contractions at self-estimated 100, 75, 50, 25 and 10 percent of maximal contraction
Counter-movement jump	As high and as fast as possible	Five trials of single repetition jumps

Low-cost electromyography - Validation against a commercial system using both manual and automated activation timing thresholds.

Heywood S¹, Pua YH², McClelland J³, Geigle P⁴, Rahmann A⁵, Bower K⁶, Clark R⁶.



Low-cost electromyography - Validation against a commercial system using both manual and automated activation timing thresholds.

Heywood S¹, Pua YH², McClelland J³, Geigle P⁴, Rahmann A⁵, Bower K⁶, Clark R⁶.

Table 2

Concurrent validity: Relative agreement (ICC), Spearman's correlation coefficient and mean difference between the Commercial EMG system and the Custom EMG system for peak Vastus Lateralis activity.

Exercise	COM Peak (%MVC)	CUS Peak (%MVC)	Relative agreement (ICC)	r _s	MD (%)	SD
Single Squat Slow	81 ± 35%	76 ± 29%	0.85	0.62	-6	23
Triple Squat Slow	87 ± 38%	81 ± 25%	0.77	0.60	-6	28
Single Squat Fast	81 ± 34%	78 ± 29%	0.80	0.64	-3	26
Triple Squat Fast	110 ± 46%	105 ± 33%	0.81	0.73	-5	31
Single Step Up	154 ± 82%	150 ± 60%	0.89	0.87	-4	45
Triple Step Up	204 ± 97%	191 ± 77%	0.85	0.79	-13	63
Knee extension	54 ± 35%	51 ± 42%	0.96	0.82	-3	16
Jump	189 ± 115%	180 ± 69%	0.81	0.50	-9	76

COM: Commercial EMG system; CUS: Custom-made EMG system; MVC: Maximum Voluntary Contraction; ICC: Intraclass Correlation Coefficient, r_s Spearman's correlation coefficient, MD: Mean score difference (CUS-COM); SD: standard deviation.

Questa tabella è relativa ai valori di picco, ma risultati analoghi si hanno per i valori medi e la durata

Low-cost electromyography - Validation against a commercial system using both manual and automated activation timing thresholds.

Heywood S¹, Pua YH², McClelland J³, Geigle P⁴, Rahmann A⁵, Bower K⁶, Clark R⁶.

Limiti dello studio:

Differente posizionamento degli elettrodi nei due casi

“The relative alignment and movement of muscle fibres, location of the innervation zone, and cross-talk between muscles is known to influence EMG signal intensity and quality”

Differenze nel guadagno dei due sistemi e nella risoluzione del convertitore analogico digitale

Numero piccolo di soggetti (10 donne)