



# ultium®

EMG



## Electromyography (EMG) Redefined

*Highest Fidelity Data*

*Lowest Baseline Noise Levels  
(Static and Dynamic)*

*Plug-and-Play Smart Sensor System  
(Featuring SmartLeads)*

*Unlimited Capture and Analysis Potential*

ultium<sup>®</sup> EMG



# Introducing the Ultium<sup>®</sup> Biomechanics Research System

Noraxon's new line of ultra-premium wireless sensors for biomechanics.

## Next Generation EMG

Ultium-EMG was designed to be the most intelligent and precise EMG system ever built. With the world's best EMG technology at its core, the Ultium-EMG sensor system is a multi-modal, wireless device that delivers unprecedented data integrity and evaluation capability. The system features new, patent-pending set of "SmartLeads", which transform the EMG device into an intelligent sensor for virtually any type of biometric and physiological data, from any type of hardware.

The full-featured Ultium-EMG sensor samples up to 4,000 times per second, synchronizes in real-time, and demonstrates the lowest baseline noise with the fewest native artifacts of any similar technology.

Ultium-EMG combines the best in electromyography with the flexibility to accurately capture the most interesting aspects of human movement.

# Four decades of EMG expertise.

Clarity and reliability that always meets expectations,  
any way you measure it.

## Patented Innovations for Evidence-Based Excellence

At the heart of Noraxon's biomechanics platform are patented and FDA-approved technologies that power world-class data capture. The result is reliable, repeatable and pure data that enables the precise study of human movement.

### HARDWARE FEATURES

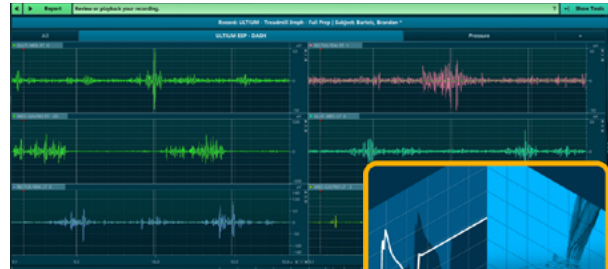
- Up to 4,000 Hz EMG sampling rate
- 24-bit internal sampling resolution
- $\pm 24,000 \mu\text{V}$  EMG input range
- Baseline noise  $<1\mu\text{V}$
- $\text{CMRR} \leq -100\text{dB}$
- Optimal signal to noise ratio
- Integrated 16g accelerometer (16-bit resolution)
- Proprietary radio frequency hopping protocol
- Sweat-resistant design
- Software controlled digital filtering
- Shielded cables for minimal artifact
- Internal memory for  $>8$  hours of data logging
- EMG + accelerometer data (2000Hz / 500Hz)
- "Lossless" on-board data recovery technology, with wireless or post-hoc high-speed recovery via dock
- Up to 32 channels of analog output available

### SPECIAL FEATURES

- Built-in impedance checker
- Battery status monitor
- *SmartLead* auto detection
- Find My Sensor visual feedback



Anchoring the system is the Ultium wireless receiver, which receives, synchronizes, and simultaneously processes data from up to 16 Ultium-EMG sensors.



### FULL-FEATURED SOFTWARE

The myoMUSCLE™ software module features an intricate and sophisticated toolset capable of handling any type of electro-kinesiological data captured with the Ultium-EMG sensors. Real-time data is automatically synchronized and viewable through pre-configured, customizable reports, enabling detailed insight for performance enhancement, injury recovery or research metrics. Multiple data export formats and HTTP streaming also allow compatibility with third-party research and animation programs.



To assure a comprehensive view of biomechanics, myoMUSCLE is fully integrated and synchronized across the myoRESEARCH® software platform, a full-featured ecosystem that covers the entire spectrum of biomechanics including EMG, kinetics (pressure and force), kinematics (motion and video), and other bio-signals.



### AVAILABLE SMARTLEADS

- Surface EMG
- Footswitch (FSR or insole)
- Fine-Wire EMG
- Handgrip Dynamometer
- 2D Goniometer
- Analog Input Probe (3-channel)
- Flexiforce - local pressure
- Physiomonitor (breath/heart rate)
- Accelerometer (all-in-one 24g/100g/400g)
- Force Sensor (100lb or 500lb)



# ultium® EMG

Ultium-EMG was designed to be, simply, the most precise EMG system ever built.

Sophisticated advances in technology resulted in the patent-pending "SmartLead" system, which transforms the device into an intelligent sensor for virtually any type of data, from any type of hardware. Ultium-EMG combines the best in electromyography with the flexibility to accurately capture the most interesting aspects of human movement. Any data. Anywhere.



## TECHNICAL DATA

### POWER AND SYNCHRONIZATION

- Receiver: USB connection to PC (up to 25m)
- TTL 2-5V sync input
- Wired/wireless exact output sync system
- Powered by USB

### OUTPUT AND TRANSMISSION FREQUENCY

- up to 100 mW
- 30-meter sensor transmission range
- Proprietary radio frequency hopping protocol
- 2402-2480 MHz
- 16-bit analog outputs with adjustable gain
- Fixed output delay: 300 ms

### REAL-TIME OFFLINE RECOVERY

- 2GB onboard memory, 9-18 hours
- Selectable wireless or docked data recovery

### EMG SENSOR DATA ACQUISITION

- 24-bit ADC, dynamic resolution
  - 0.3 $\mu$ V resolution for 0 to 5,000 $\mu$ V
  - 1.1 $\mu$ V resolution for 5,001 to 24,000 $\mu$ V
- Low transmission delay
- Selectable low-pass cutoff at 500/1000/1500 Hz
- Selectable high-pass cutoff at 5/10/20 Hz
- Selectable sample rate of 2000 or 4000 Hz

### EMG PREAMPLIFIER

- No notch (50/60 Hz) filters
- Baseline noise: <1 $\mu$ V RMS
- CMRR < -100dB
- Input impedance: > 1,000 M $\Omega$
- Input range: +/- 24mV

### REAL-TIME OFFLINE RECOVERY

- 2GB onboard memory, 9-18 hours
- Selectable wireless or docked data recovery

### ULTIUM-EMG SENSOR DIMENSIONS

- Size: 37 x 24.5 x 16.5 mm (LxWxH)
- Weight: 14 grams

### ULTIUM-EMG DOCKING STATION DIMENSIONS

- Size: 174 x 92 x 169 mm (LxWxH)
- Weight: 545 grams

### ULTIUM-DASH RECEIVER DIMENSIONS

- Size: 261 x 36 x 29 mm (LxWxH)
- Weight: 185 grams

## CERTIFICATIONS



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