

# BTS FREEMIG

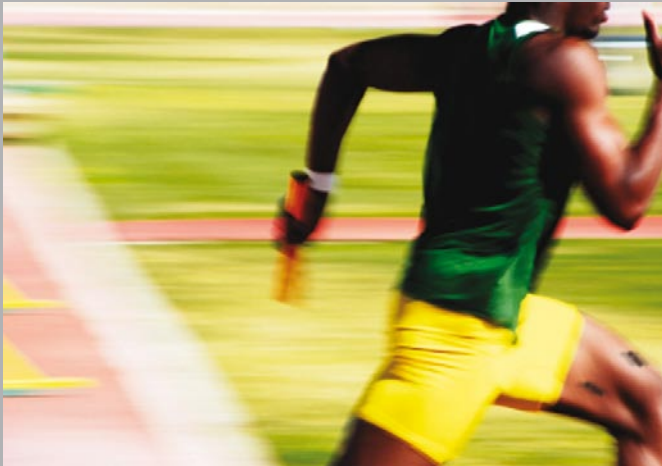
Portable Surface EMG System using Wireless Probes



**BTS** Bioengineering

# BTS FREEEMG

## Portable Surface EMG System using Wireless Probes



BTS FREEEMG represents a generation leap in diagnostic device technology for surface electromyography analysis during the motion.

Employing entirely on wireless technologies, BTS FREEEMG is the first electromyography unit in the world using 16 miniaturized probes with active electrodes weighting just 8 grams for signal acquisition and transmission. The probes amplify the EMG signals, digitise them and communicate with a receiving unit, that is compact and light (240 grams), which can be worn by the patient, left on the table or held by the doctor.

The complete absence of wiring allows not only for quick preparation of the patient but inconvenience is also minimised because the patient can move around freely and comfortably.

The substantially reduced size and weight of the variable geometry probes allows them to be used on any body segment for all types of movement (walking, running, jumping, etc) on a variety of subjects without affecting in any way the motor pattern of the subject. Several hours of data can be recorded thanks to the use of environmentally friendly rechargeable batteries.

BTS FREEEMG is supplied with either Myolab or Myolab Clinic, the powerful software packages that BTS has developed for EMG signal monitoring, processing and reporting.

Myolab with its advanced analysis tools is the more flexible solution providing advanced analysis, including the measurement of localized muscle fatigue and the study of cyclic contractions.

With Myolab BTS FREEEMG can be used in numerous fields of application such as research, sports, occupational medicine, gnatology, neurology and orthopaedics.

Myolab Clinic includes a protocol for the functional evaluation of the gait and, in combination with foot switches, can automatically identify events such as toe-off and heel-strike and normalized gait cycle data. With Myolab Clinic, BTS FREEEMG becomes the most advanced diagnostic tool available today to evaluate neurological and orthopaedic pathologies, pharmacological therapies, motor deficit progression and to carry out rehabilitative follow-ups.



### The Most Advanced Electromyography Unit in the World

BTS FREEEMG uses the best technology which is available today. Totally wireless, it uses probes with active and variable geometry electrodes, weighting just 8 grams.

### Quicker and More Accurate Analysis

The total absence of cables makes for a quick patient setup. The probes are attached directly to the pre-gelled electrodes and being lightweight they do not require any additional fixing such as adhesive tape. The patient can move around freely.

### Powerful and Comprehensive

16 electromyography channels, 2 foot switch channels covering up to 8 contact areas, and electrogoniometers or accelerometer probe.

### Easy to Use

The system is set up either from the by the workstation or from the mobile receiving unit, which is equipped with a high-resolution touch-screen display and an intuitive graphical interface.

### Reliable

The technology used, the sampling rate of up to 1 KHz frequency for the surface mounted electrodes and up to 4 KHz for fine-wire electrodes (options) and the 16 bit resolution for each channel, ensure that the acquired signal has low noise and is free from movement artefacts. Data is stored in an onboard solid-state memory.

### Prolonged Battery Life

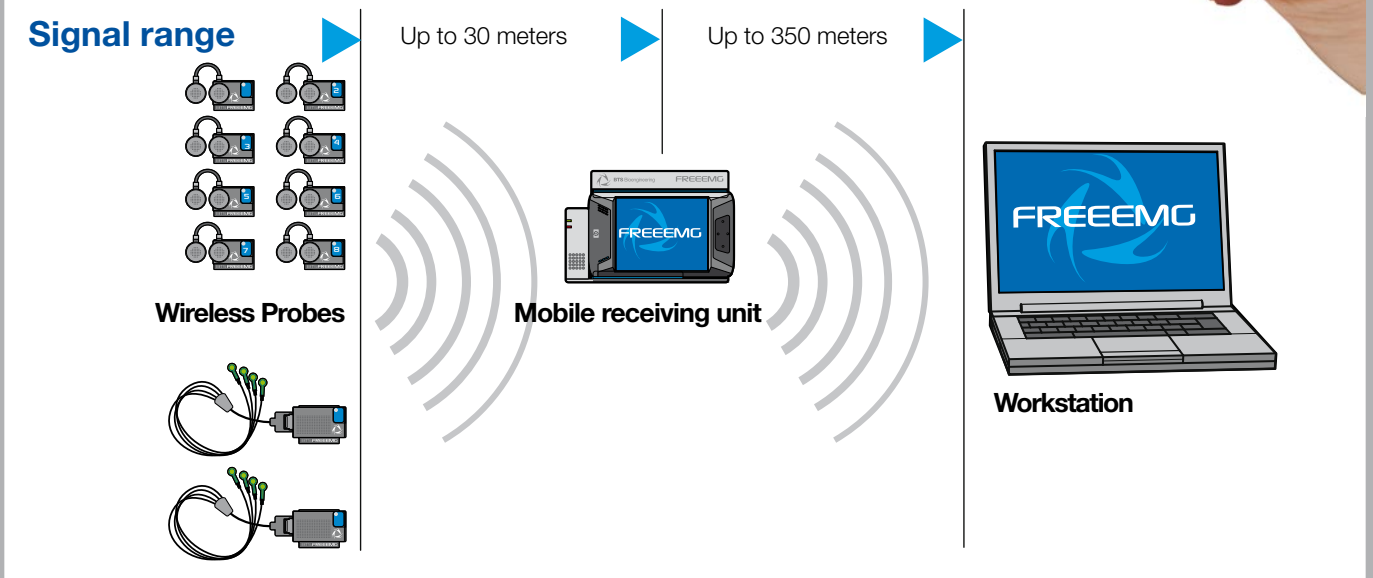
More than 3 h of non-stop acquisition, by placing the probes in Stand-by mode, between acquisitions, it is possible to perform a whole day's recording. Easy and quick recharging by clipping onto a proprietary battery charger.

### Signal Range

Up to 30 meters for the transmission between the probes and the receiving mobile unit in free space; up to 350 meters for the data transfer between the mobile unit and the workstation.

### Interoperability

Can interoperate with movement analysis, posturometry and stabilometry systems.



# BTS FREEEMG



## Technical features \*

### Wireless Probes

Surface electrodes	Variable geometry electrodes with mounting clip 16-bit resolution - acquisition frequency up to 1KHz
Wire electrodes	Fine-wire electrodes 16-bit resolution - acquisition frequency up to 4KHz
Data transmission	Wireless IEEE802.15.4 (probes - receiving unit)
Battery	Rechargeable with proprietary charger (clip connector)
Autonomy	3h battery life with non-stop recording. Energy Saving with Stand-by mode
Range probes - receiving unit	Up to 30 meters in free space (it can decrease to 15/20m in the presence of obstacles)
Memory	On board solid state memory system
Status LED	Acquisition/stand-by mode and low battery
Weight and size	8 grams including battery 23.8 x 37 x 10mm main electrode Ø 16.5 x 10mm satellite electrode

### Mobile Receiving Unit

EMG channels	Up to 16 wireless probes
Data transmission	Wireless WiFi standard 802.11b (receiving unit – workstation)
Display	4" VGA touch-screen
Recording duration	Up to 9 hours with a single battery or continuously with power supply (desk mode)
Range receiving unit-workstation	Up to 30 meters indoor – up to 350 meters outdoors
Weight and size	240 grams – 152 x 82 x 22.5mm

### Software BTS Myolab/Myolab Clinic

- Data acquisition, display and analysis using drag&drop
- Oscilloscope for the real-time viewing of the signals
- Database for data storage
- Synchronised display of electromyographic signals and video signals from up to four BTS VIXTA cameras
- Analysis of localized myoelectric muscular fatigue phenomena. (Myolab)
- Protocol for the functional evaluation of gait (only Myolab Clinic)

### Options

#### BTS Workstation

Desktop or laptop PC dedicated to the processing of the electromyography signal and to wireless communications with the receiving unit.

#### Wireless Foot Switch Probes

Independent FSR sensors for the automatic identification of the gait phases  
Up to 4 individual on-off sensors for each Foot Switch probe (8 in all).

#### Wireless Electrogoniometer Probes

Strain gauge technology for the accurate measurement of the angles described by the joints in the different planes.

#### Wireless Accelerometer Probes

\* Technical specifications are subject to change without prior notice.

BTS FREEEMG, BTS PocketEMG, BTS VIXTA, BTS Myolab, BTS MyolabClinic, are products of BTS S.p.A. All other trade-marks are property of their respective holders.

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