BTS FREEEMG 300

Portable Surface EMG System using Wireless Probes

BTS Bioengineering

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The most advanced Electromyography Unit in the world.
BTS FREEEMG 300 represents a generation leap in diagnostic device technology for surface dynamic electromyography analysis.
Based entirely on wireless technologies, BTS FREEEMG 300 uses 16 miniaturized probes with active electrodes weighing less than 9 grams for signal acquisition and transmission.
BTS FREEEMG 300 stands for an improvement in the performance of the FREEEMG systems already appreciated by researchers and clinicians throughout the world. These practitioners need to be able to rely on a daily basis on a highly efficient system easy to configure and use, for differentiated clinical and researcher applications.
The probes amplify the EMG signals, digitize them and communicate with the compact and light receiving unit, which can be either way worn by the patient, left on the table or held by the doctor.
The complete absence of wiring not only minimizes the patient distress during the preparation but also grant him full range of motion during the task without restrictions.
The probes variable geometry and the substantially reduced size and weight allow them to be used on any body segment and during all types of movement (walking, running, jumping, etc) on a variety of subjects without affecting in any way the motor pattern.
Thanks to the use of environmentally friendly rechargeable batteries several hours of data can be recorded.
BTS FREEEMG 300 is supplied with Myolab, the smart and easy to use software that BTS has developed for EMG signal acquisition, visualization, and a first level of processing.

BTS Myolab with its analysis tools is the most flexible solution providing advanced analysis, including the localized muscle fatigue measurement and cyclic contractions computing.
As option, for advanced EMG software applications BTS also offers BTS EMG-Analyzer and BTS EMGenius.

BTS EMG-Analyzer
BTS EMG-Analyzer is the most complete software solution for EMG signal analysis. Includes predefined templates for evaluations in clinic, sport and research field: jump, pliometry, gait, fatigue analysis, isokinetics, etc… It integrates also an editor to design elaboration protocols: the user can develop quickly and effectively customized elaboration protocols. Thanks to an innovative visual object interface, the mathematical analysis language is translated into graphical form.

BTS EMGenius
BTS EMGenius is the applicative software for the functional evaluation of cycle movements (as in the gait, by means of an automatic identification of the gait phases), or of movements as "hand to mouth", "sit to- stand", "hand flex-extension", "reaching", etc.
BTS EMGenius provides a user friendly and intuitive interface: the operator immediately learns how to use the software achieving the highest productivity level for the lab.

Applications
BTS FREEEMG 300 can be used in research, sports, occupational medicine, gnatology, neurology and orthopaedics.
With the available software suites, BTS FREEEMG 300 becomes the most advanced diagnostic tool available today to evaluate:
- neurological and orthopaedic pathologies,
- pharmacological therapies,
- motor deficit progression,
- use of orthesis,
- rehabilitative follow-ups,
- sport training optimization
- …

Weigh less than 9 grams, including battery

Record of miniaturization

BTS FREEEMG 300 uses the best technology available today. Totally wireless, it integrates probes with active and variable geometry electrodes, weighing less then 9 grams.

Quicker Analysis and Increased Accuracy

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

The patient can move around freely.

Powerful and Comprehensive

16 electromyography channels, 2 footswitch channels covering up to 8 contact areas, and up to 4 electrogoniometers probes (each takes up 2 EMG channels).

16bit Accuracy

The sampling rate of up to 4 KHz and the 16 bit resolution give to the acquired signal the highest quality ever, providing "low noise" and the absence of movement artifacts.

On-board memory

The probes are equipped with a solid-state buffer memory to guarantee data safety in case of WiFi signal loss or when the probes are simply out of range during the acquisition.

More than 5h of non-stop acquisition

The large autonomy and energy-saver battery insure a whole day recording. Easy and quick recharging by clipping onto the proprietary battery charger.

Touch-screen interface

The system can be managed either from the workstation or from the mobile receiving unit, which is equipped with a high-resolution touch-screen display and an intuitive graphical interface.
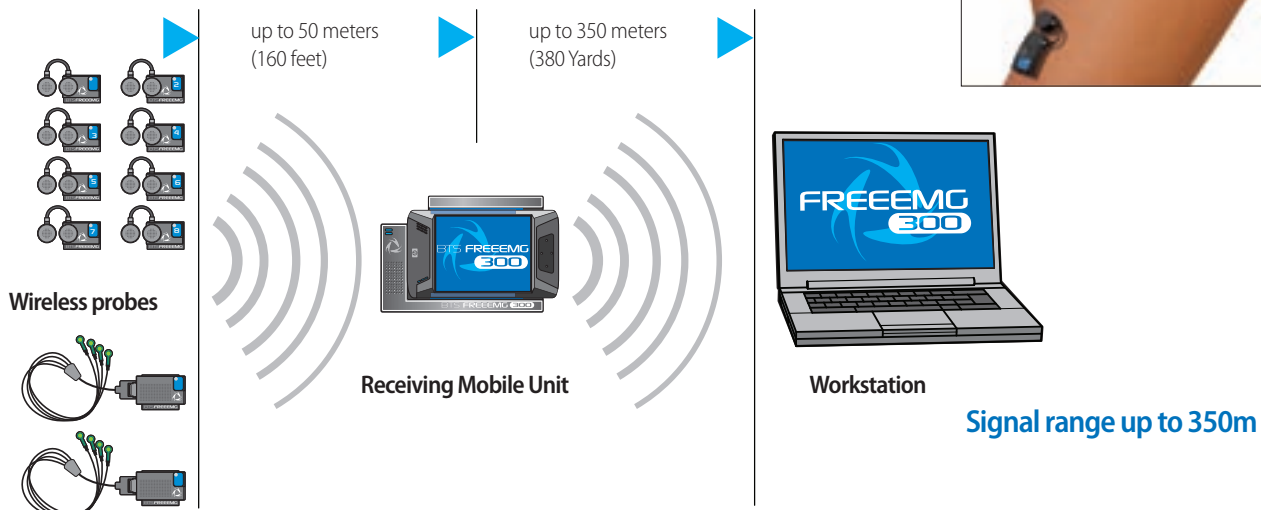
Signal Range

Up to 50 metres for the transmission between the probes and the mobile receiving unit; up to 350 metres for the data transfer between the mobile unit and the workstation.

Interoperability

Designed to interoperate with movement analysis, posturometry and stabilometry systems, thanks to the software integration through SDK or by means of the analogical output receiver.

It is intended also to interoperate with isokinetic machines (BIODEX, CYBEX and CON-TREX), rehabilitative robots (Reo-go, BTS ANYMOV) and virtual reality therapeutic systems (BTS NIRVANA) for the evaluation of real muscle activity during rehabilitation or sport training and planned testing activities.

Real Dimension

Quick setup

up to 50 meters (160 feet)

up to 350 meters (380 Yards)

Wireless probes

Receiving Mobile Unit

Workstation

Signal range up to 350m

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Technical features*

Wireless Probes

Surface electrodes	Variable geometry electrodes with mounting clip 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	5h battery life with non-stop recording, 5 days with Stand-by mode
Range probes - receiving unit	Up to 50 meters (160 feet) in free space (it can decrease to 30m -100 feet- in the presence of obstacles)
Memory	On board solid-state buffer memory system
Status LED	Acquisition/stand-by mode and low battery
Weight	<9 grams including battery
Size	23.8 x 37 x 10mm main electrode - Ø 16.5 x 10mm satellite electrode
Identification Labels	Available in four colors

Mobile Receiving Unit

EMG channels	Up to 16 wireless probes on each receiving unit
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
Range receiving unit - workstation	Up to 30 meters (100 feet) indoor – up to 350 meters (380 yards) outdoors
Weight and size	360 grams – 155 x 106 x 35mm

Software BTS Myolab
- Data acquisition, display and analysis
- Analysis of localized myolelectric muscular fatigue phenomena
- Oscilloscope for the real-time viewing of the signals
- Database for data storage

*
Technical specifications are subject to change without prior notice.

Options

Software BTS EMGenius
Database for data storage. Tool for the automatic elaboration of EMG signals relative to cycle movements as for instance gait analysis or upper limb pointing and reaching.

Software BTS EMG-Analyzer
Database for data storage. Graphic interface to build analysis template: operators for filtering, spectrum computation, contact event measure, latencies, thresholds, fix and mobile windows integration, RMS, interpolation, fatigue analysis, etc. Tool for the creation of customized report of the exams in HTML format completely configurable by the user.

BTS Docking Station
Multifunctional charger equipped with internal batteries to recharge the EMG probes when the power connection is not available.

BTS Workstation
Preconfigured Desktop or Laptop PC dedicated to the electromyography signal processing and to the wireless communications with the receiving unit.

Fine-Wire Adaptors
The EMG probes can be used also to acquire the EMG signal by means of Fine-Wire electrodes. The connection is easily realized through the dedicated adaptors equipped with clip and Fine-Wire links.

Wireless Foot Switch Probes
Independent FSR sensors for the automatic gait phases identification Up to 4 single on-off sensors for each Foot Switch probe (8 in total).

Wireless Electrogoniometer Probes
Strain gauge technology for the accurate measurement of the angles drown by the joints in the different planes.

Video Acquisition System
BTS VIXTA, system to video record using up to 4 TV cameras simultaneously, natively synchronized with EMG signals

Analog Output Receiver
This tool allows for a quick integration with other motion analysis systems. It consists of a wireless receiver with analog output feature: raw EMG data available in analog format, simultaneously with the digital wireless data transmission. It is equipped with an USB interface for plug and play.

BTS FREEEMG & ISOKINETIC Kit
For integration with isokinetic machines: BIODEX, CYBEX, CON-TREX.

BTS COMMERCIAL PARTNER NETWORK

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