



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076

Ref. PR No.: 1000053963

RFX. No.:6100002772

Item Name: Portable, cable free, high-density surface Electromyography System

Sr. No.	Tender Specifications	Compliance (Yes/No)	Additional Information
1.	Portable, cable free, high-density surface Electromyography System		
A.	General Description: One unit of portable, cable free, high-density surface Electromyography (EMG) System.		
B.	The portable, cable free, high-density surface electromyography (EMG) system should have the following components with specifications listed below: a) Main receiver unit: i. System should be supplied with one unit of receiver having 32 channel capacity for cable free standard EMG and 64 channel capacity for HD sEMG system. ii. Receiver should allow for simultaneous data acquisition from cable free surface EMG sensors and HD sEMG sensors, FSR, load cells, goniometers, etc. iii. Receiver should have at least four user configurable trigger input and output channels for third party device synchronization. iv. Receiver should have push buttons for markers or trigger events during the real time data streaming. v. Receiver should have at least six user configurable analog signal input with 24-bit signal resolution and sampling at 6k – 48ksa/sec. vi. Receiver should have microphone input for recording voice and sound with time synchronization with cable free EMG sensor data. vii. Wireless communication range – 40 meters or more. viii. Wireless communication protocol – Proprietary wireless radio frequency operating in 2.4 – 2.83 GHZ spectrum. ix. System should come with four sets of RF operating channels for use at any given time for maximum performance in varied environments and crowded RF conditions. x. During real time data system should not require any buffering, retransmission of signals or post data collection uploading no matter the number of channels / sensors utilised. xi. The system should be capable of integration with other 3rd party systems such as motion capture systems, force		

platform systems along with the capability of all 32 EMG channels to be streamed into the motion capture system.

b) Surface electromyography sensors:

- i. System should be supplied with 16 cable free parallel bar dry electrode electromyography sensors with double differential electrode placement.
- ii. Sensors should have fixed interelectrode spacing of 1 cm to avoid motion artefacts and crosstalk.
- iii. Sensor contacts should be 4 silver bars, each measuring 10 mm in length, 1 mm in diameter, and spaced 10 mm apart
- iv. Contoured surfaces to maximize sensor-skin interface stability
- v. Sensors should be hermetically sealed to prevent moisture, sweat, humidity, ambient electrical noise entering the sensors.
- vi. No conducting gel should be required.
- vii. Sensors should come with inbuilt IMU and onboard Butterworth bandpass, RMS envelope EMG filters, etc.
- viii. Sensors should have a sampling frequency of up to 4370 Hz per sensor.
- ix. Sensors should have selectable input EMG range of $\pm 11\text{mV}$ and $\pm 22\text{ mV}$ or better
- x. Selectable EMG bandwidth – HPF up to 10 Hz and LPF up to 800 Hz or better
- xi. EMG base line noise - 750 nV
- xii. Battery life 8 hour in single charge or better
- xiii. Recharge time – Less than 2.5 hours.
- xiv. Weight of the sensors should be less than 15 grams
- xv. System should be able to upgrade in future with 16 more cable free EMG sensors, High density EMG sensors, Auxiliary sensors or combination of any with the same existing receiver.

c) Charging station:

- i. System should come with one charging station, and it should charge 16 sensors simultaneously
- ii. Power supply – 12VDC
- iii. Charging station should come with built in magnet to turn on the sensor.
- iv. LED lights to indicate the charging status while sensors docked in.
- v. Charging case weight less than 300 grams.
- vi. Should come with suitable power supply and cords compatible with Indian line voltage.

d) Accessories:

- i. Adhesives sensor interface of 40 packs, total of 3200 stickers – 4 slots arrangement for the sensor.
- ii. It should be medical grade double sided adhesives
- iii. System should come with two Power cord for Main receiver unit and charging unit respectively.
- iv. System should come with two each auxiliary adapters for FSR, Load cell, goniometer.
- v. FSR adapter should come with 8 FSR sensors or 2 Pairs consisting of 4 sensors.
- vi. Load cell adapter should come with 2 load cell button type sensors.

	<p>vii. Goniometer adapter should come with 2 goniometer sensors.</p> <p>e) Interface receiver:</p> <p>i. System should come with one interface receiver device capable of integrating Bluetooth and ANT+ devices.</p> <p>ii. The interface receiver device should have at least 6 slot capacity.</p> <p>iii. System should be provided with two muscle oxygen saturation sensor and one hand dynamometer sensor.</p> <p>iv. All the physiological data should be time synchronized with EMG sensors data in a single software interface.</p> <p>v. Same interface device should be used for integrating with other physiological parameters like metabolic analysis and heart rate, etc when upgraded in the future.</p> <p>f) User guide: System should come with detailed user guide.</p>		
C.	<p>Software for data acquisition and analysis:</p> <p>i. Software should stream the data real time of all connected devices for data visualization</p> <p>ii. To improve user experience software should have biofeedback options.</p> <p>iii. Software should allow for event marking based on threshold detection to automate data metrics.</p> <p>iv. Software should also provide provision for self-generated event marking.</p> <p>v. Centralise database structure to migrate or import files to any system at any given point in time.</p> <p>vi. Export options should include xlsx, csv, c3d, txt, pdf, mat, etc.</p> <p>vii. Software should also have the provision for streaming of the data real time to Python, C#, Linux, Unity, etc</p> <p>viii. Multiple user software license at no extra cost for the life of the system.</p> <p>ix. The supplier should provide software updates and technical support at no extra cost for life of the system. No maintenance or subscription charges shall be imposed at any stage.</p> <p>x. API should be provided free of cost for the life of the system.</p>		
D.	<p>The entire system should meet requisite electro-medical safety and regulatory standards such as CE-mark, ISO 13485 or substantially equivalent.</p>		
E.	<p>Comprehensive warranty for the system should be 12 months warranty and 12 months extended warranty from the date of installation.</p>		
F.	<p>Remote installation/demonstration, support and training is included (on-site installation/demonstration and training support if required).</p>		
G.	<p>Free lifetime virtual training and telephone support should be available to users.</p>		

