

**Annexure-A**

**Specifications for EMG System:**

S.No.	Equipment Name	Technical Specifications	Unit	Justification	Propriety article certificate	Remarks
1	EMG system					
		<p>EMG System with following technical specifications and quantities:</p> <ol style="list-style-type: none"> <li>1. Portable EMG System to stream Pre-amplified EMG signals from wire-free EMG sensors directly transmitted to computer in real-time, without data drop.</li> <li>2. Base Station should be able to accommodate up to 4 Sensors in the system.</li> <li>3. Compatible 2 Nos. of Parallel bar EMG sensors, having Dual on-board stabilizing reference, fixed 10 mm Inter-Electrode Spacing with built-in tri-axial IMU, with Bluetooth and Wi-Fi connectivity, LED Status indicators, magnetic switch, scalable EMG Bandwidth settings, onboard processing. Each sensor should provide 1 Channel of EMG and 6 channels raw IMU (3x ACC, 3x Gyro) OR 4 channels Orientation (QUAT) data Sensors should not require external electrodes. Compatible 13 packs of sensor-skin interfaces</li> </ol>	1	Evaluates muscle activity of individual muscle normal as well as pathological. Diagnosis and management of aiming Sports, athletes	Yes	<ol style="list-style-type: none"> <li>1. Atleast 5 research paper should be published on the specific instrument.</li> <li>2. The reliability and validity of the equipment should be provided.</li> <li>3. There should be scope of extension of validity for the equipment.</li> </ol>

		<p>with 80 interfaces in each pack should also be supplied.</p> <p>4. Compatible 1 no. Of 4-point EMG Sensor for collecting EMG signals for further decomposition in individual motor units under dynamic conditions, with built-in tri-axial IMU, with Bluetooth and Wi-Fi connectivity, LED Status indicators, scalable EMG Bandwidth settings, onboard processing. Each sensor should provide 4 Channel of EMG from same muscle, and 6 channels raw IMU (3x ACC, 3x Gyro) OR 4 channels Orientation (QUAT) data. Compatible 7 packs of sensor-skin interfaces with 80 interfaces in each pack should also be supplied.</p> <p>5. 1 license of compatible software for investigation of neural firing behavior from 4 channel EMG data collected form 4-point EMG Sensor mentioned in 4. above. Software should automatically extract and visualize motor unit shapes and behavior, by motor unit extraction from EMG signals collected from same muscle site, using 4-point sensor above. Software should enable quantification and comparison of neural activation across time, muscles and subjects.</p> <p>6. Compatible 1 no. of dual head EMG + IMU Sensor for smaller muscles having Dual on-board stabilizing reference, fixed 10 mm Inter-Electrode Spacing with built-in tri-axial</p>				
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		<p>IMU, with Bluetooth and Wi-Fi connectivity, LED Status indicators, magnetic switch, scalable EMG Bandwidth settings, onboard processing. Each sensor should provide 2 Channel of EMG and 6 channels raw IMU (3x ACC, 3x Gyro) OR 4 channels Orientation (QUAT) data Sensors should not require external electrodes. Compatible 10 packs of sensor-skin interfaces with 80 interfaces in each pack should also be supplied</p> <p>7. Should have optional Hardware for upgrade, to integrate external, compatible hardware for wireless Physiological data recordings, like VO2 Max, Muscle Oxygenation, Heart Rate, Hand Dynamometer etc.</p> <p>8. Sensors' body should be UV-sealed to prevent moisture from entering the sensor &amp; to enhance patient safety and should be made of Medical-grade polycarbonate.</p> <p>9. Operating Range: 40m for proprietary RF protocol and should ensure no data latency between sensors and a high level of transmission robustness with zero frame drops.</p> <p>10. EMG Sampling Rate: Up to 4370 Hz</p> <p>11. Accelerometer Sampling Rate: Up to 963 Hz</p> <p>12. Gyroscope Sampling Rate Up to 741 Hz</p> <p>13. Orientation Sampling Rate Up to 222 Hz</p> <p>14. Resolution: 16 bit, 168 nV per bit</p>				
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		<p>15. Baseline Noise: 750 nV typical</p> <p>16. CMRR &lt; -80 dB</p> <p>17. EMG Bandwidth: Selectable cutoff frequencies between 10-850 Hz</p> <p>18. Battery Life: 8 hours</p> <p>19. Recharge Time: &lt; 2.5 hours</p> <p>20. Inter-Sensor Latency 0 ms (No inter-sensor latency)</p> <p>21. Support for other optional Sensors: Mini EMG + IMU Sensor for smaller muscles, Duo Mini sensor with 2 EMG channels in a sensor, 4-ch mini-EMG + IMU sensor, FSR Sensor, Load Cell Adapter, Goniometer Adapter, EKG Sensor, Analog Adapter.</p> <p>22. Integration with 3rd party -Digital API Six user-configurable analog inputs and pushbuttons to create data markers or trigger events during data streaming.</p> <p>23. Windows compatible EMG acquisition software with following features</p> <ul style="list-style-type: none"> <li>• Integrated database</li> <li>• control modes of the sensors</li> <li>• Data normalisation</li> <li>• MVC</li> <li>• Control sampling rate</li> <li>• Export data in csv, xml formats etc.</li> </ul> <p>24. Windows compatible EMG acquisition software with following features:</p> <ul style="list-style-type: none"> <li>• Integrated Database</li> <li>• Improve the quality of EMG data</li> </ul>				
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		<ul style="list-style-type: none"> <li>• Cyclical Analysis</li> <li>• Activation Timing</li> <li>• Amplitude Analysis and Normalization of data</li> <li>• Co-activation of muscles</li> <li>• Fatigue Analysis</li> <li>• Frequency Analysis</li> <li>• Activity Tracking</li> </ul> <p>25. Software for decomposition of recorded EMG signals into Motor Units-Windows compatible EMG signal analysis software with following features:</p> <ol style="list-style-type: none"> <li>a. Loading and previewing of EMG data collected using special 4-point EMG sensors.</li> <li>b. Processing the files of EMG data collected using special 4-point EMG sensors to decompose for identifying Motor Units.</li> <li>c. Automatic identification of signal clipping due to movement artifacts or repositioning of the sensor or other unknown reasons.</li> <li>d. Visualize raw EMG data &amp; MU firing rates</li> <li>e. View MUAP waveforms</li> <li>f. See the list of analysis intervals, select active interval, and remove</li> <li>g. intervals</li> <li>h. Report-specific figures &amp; charts corresponding to the active analysis interval</li> </ol>				
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5	Air conditioner	Split Ac 3 Star, 1.5Ton	2			Daikin/Career	

