

TiCLE Health

Biosignal Analysis Training Equipment
to Implement **AI Healthcare System**



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Biosignal Analysis Training Equipment to Implement AI Healthcare System

Provides Various Biosignal Measurement Modules

Cardiac and Hematological Signals

- ECG : Electrocardiogram
- PCG : Phonocardiogram
- NIBP : Non-Invasive Blood Pressure
- SPO2 : Saturation of Peripheral Oxygen

Other Physical and Biometric Information

- EOG : Electrooculogram
- Respiration : Respiration
- TEMP : Body Temperature
- BCM : Body Composition Monitor

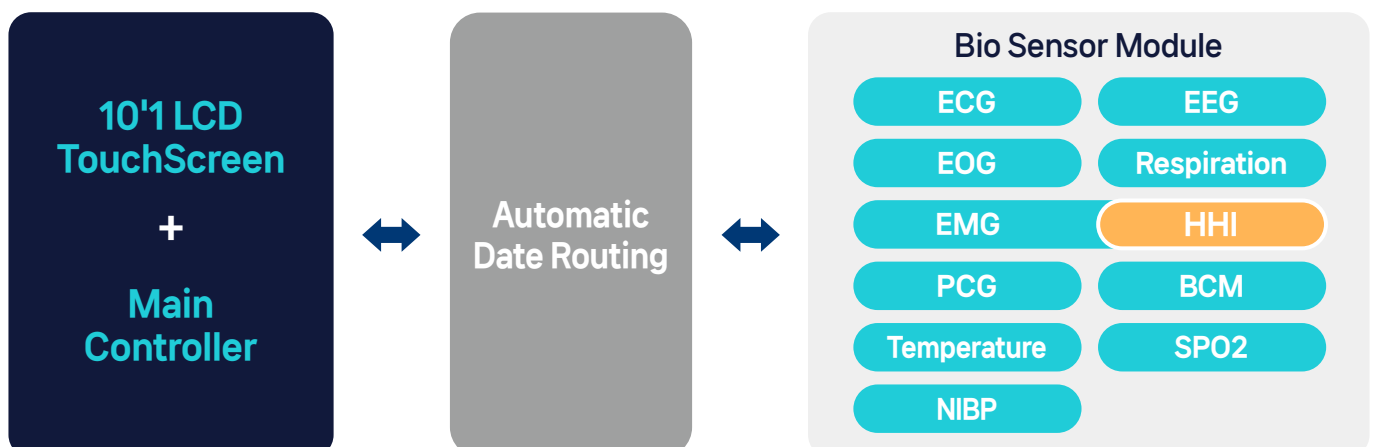
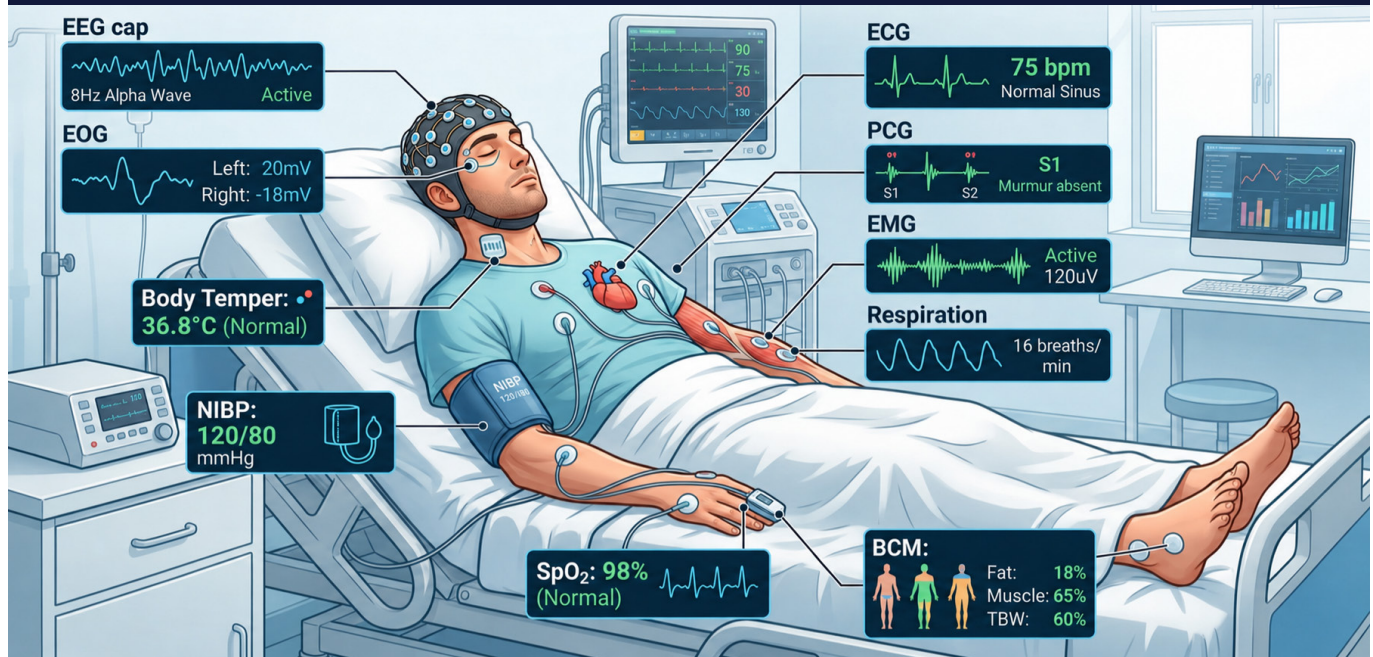
Brain and Nervous System Signals

- EEG : Electroencephalogram
- EMG : Electromyogram

Integration Interface

- USB convert : Collecting Biosignals for Artificial Intelligence Training on PC

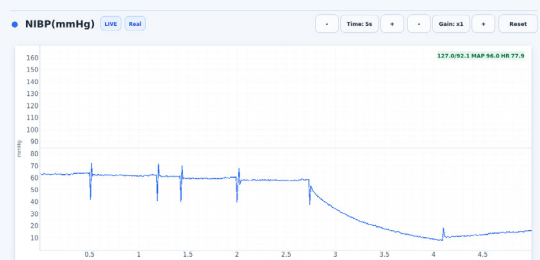
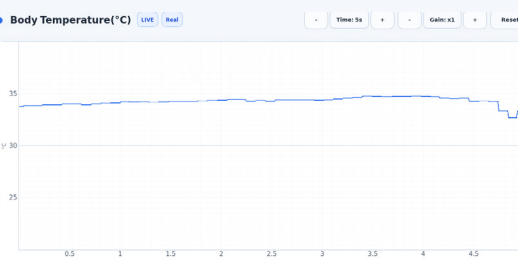
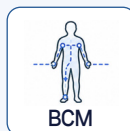
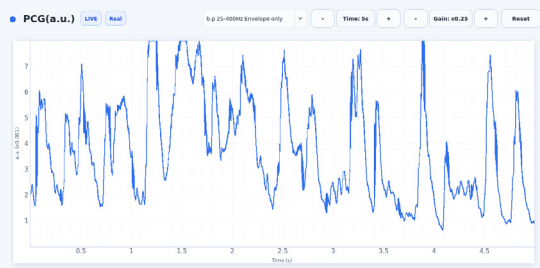
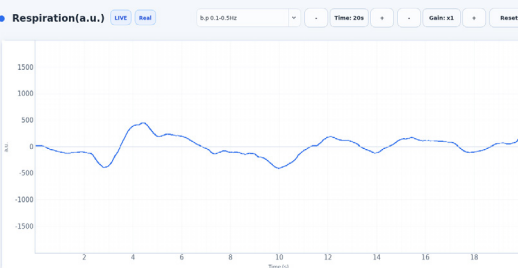
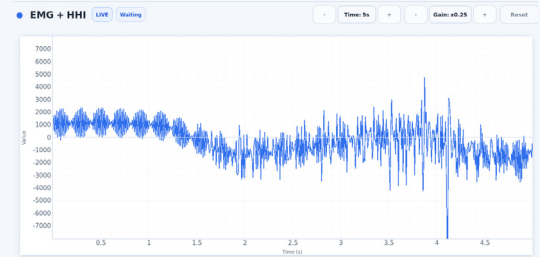
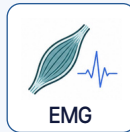
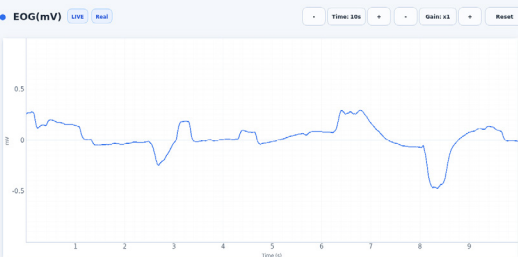
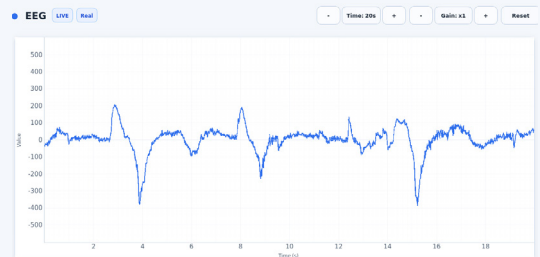
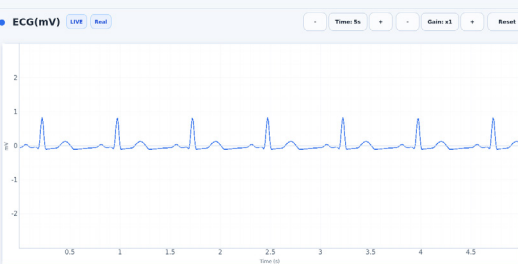
Provides various **Modular Biosignal Measurement**, including neurological and cardiovascular signals, along with other physiological signals



Touchscreen HMI

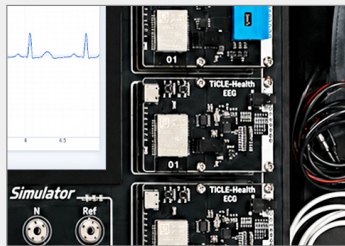


No.	Item	Description
1	Settings	Configure input method, ports, theme, and font size.
2	Channels	Select the channels to be displayed on the screen.
3	Run / Stop	Start or stop real-time graph display.
4	Capture	Save the current channel data in raw/device output format.
5	Export	Export the saved recording to an XLSX file.
6	Replay	Replay the saved recording.
7	REF	Load the saved waveform as the reference and compare it with the current waveform.
8	Filter / Time / Gain / Reset	Adjust display preset, time scale, y-axis scale, and view reset.
9	Status chips	Check the status (Live/Replay/REF) and input path.

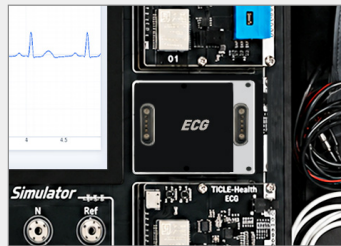


Wireless / Wired Automatic Switching

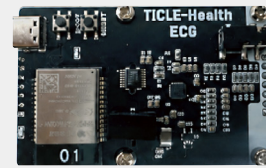
Sensor board mounted



Sensor board dismantled



Separated sensor board



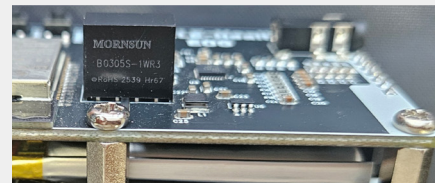
When each module is mounted to main unit, it is automatically connected to HMI via wired connection through **Automatic Data Routing**. When detached, it switches to wireless communication.

Electrical Insulation Design



Isolate power supply/MCU from biosignal measurement unit to minimize noise and support stable signal measurement.

Built-in Rechargeable Battery



With built-in battery and Wi-Fi, can be detached from main unit and measure human body signal from Any desired location.

Training Contents

11-6 ECG Electrode and Equipment

ECG electrode must make stable contact with the body. Since hair can make electrode-skin contact difficult, various methods such as gel, paste, sponge, and dry electrode are used. If contact impedance is high, noise increases, and if the electrode position is shaken, a large artifact occurs.

Since ECG amplifier must amplify very small potential, high input impedance, low noise, and sufficient common-mode rejection are important. Neural ECG is small signal at low frequency, filter and sampling settings are so important. Educational equipment often uses sampling rate of around 50 Hz, 250 Hz, 500 Hz, or 112 Hz, while higher sampling rate may be used for research or high-frequency analysis purposes.

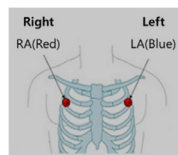
In practice equipment, the roles of the measuring electrode, reference electrode, ground, or bias electrode may vary slightly depending on the device. Therefore, before starting this practice, check the color of each cable and the function of the electrode in the equipment manual.

RA (Red)	Ref (Black)	LA (Blue)

3-5-3 Electrode Attachment Location

In the practice examples, RA, LA, and Ref electrodes are used.

- RA Electrode (Red): Below the right clavicle
- LA Electrode (Blue): Below the left clavicle
- Ref Electrode (Black): Reference location according to equipment instructions (e.g., inner left ankle or lower body)



It is appropriate to understand the Ref electrode not merely as "mass electrode," but as an electrode that assists in forming a reference potential, stabilizing the input, and reducing common noise. Since specific options may vary depending on the internal circuit design of the equipment, refer to the device manual during actual practice.

(1) Main Screen

The main screen is the screen most frequently used by the user. It generally consists of the currently selected channel name, real-time graph, measurement start/stop button, save or CSV export button, graph zoom in/out button, and sensor status display.



Number	Item	Operation
1	Settings	Set input method, port theme, and font size.
2	Channels	Select the channel to display on the screen.
3	Run / Stop	Start or stop the real-time graph display.
4	Capture	Save the received data of the current channel based on raw/device output.

Educational content covering from Biosignal Theory and Measurement Procedures to Waveform Analysis Method

Learning the collected biosignals with artificial intelligence on PC and applying them for projects

Components



TICLE-Health



Cables for Signal Measurement



Extension Cable



Electrode



Electronic Stethoscope Module



Cuff for NIBP



Power Cable