

MFER manual

1. Main window and operation

Limb lead and chest lead of 12 lead ECG is displayed at same time on the main window.

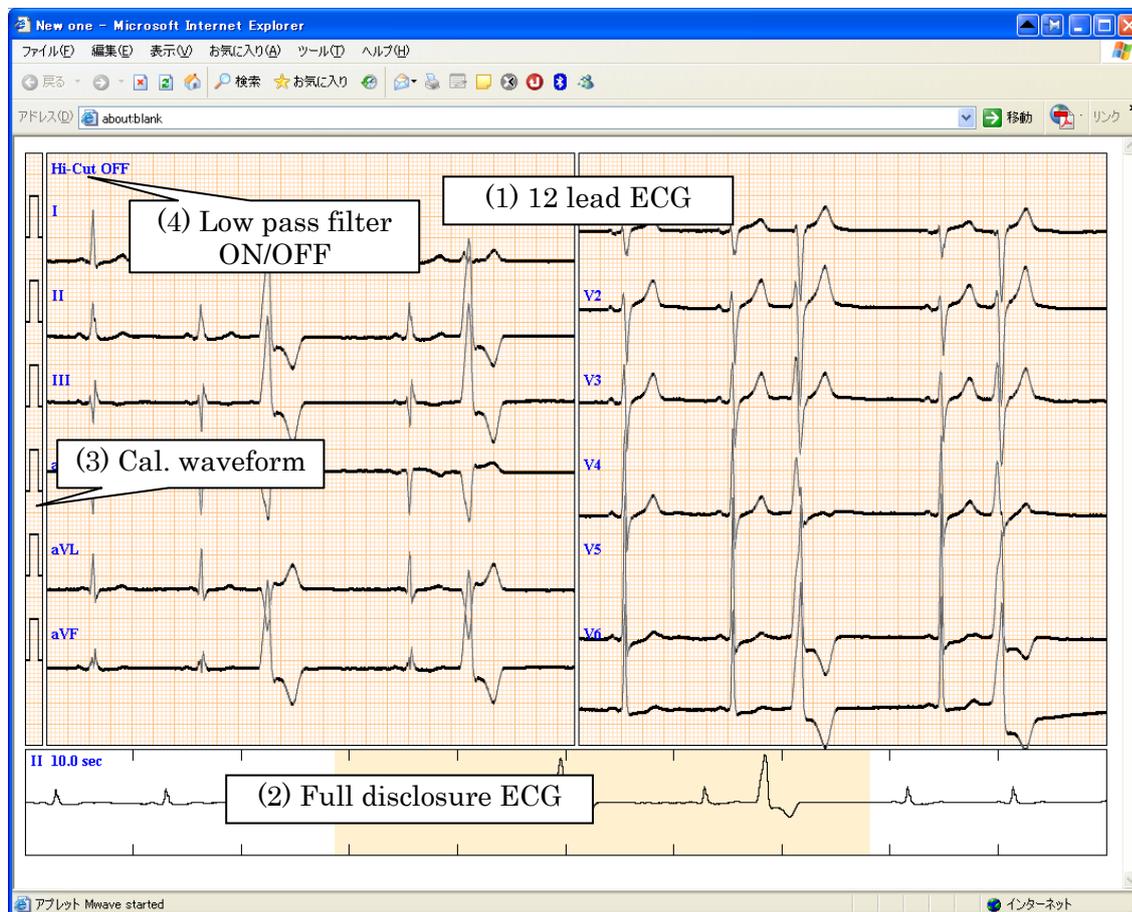


Fig. Main window

(1). Standard 12 lead ECG window

Limb lead(I, II, III, aVR, aVL, aVF) and chest lead(V1, V2, V3, V4, V5, V6) of standard 12 lead ECG is displayed on the main window at same period. In case of described only lead I and II in MFER, lead III, aVR, aVL and aVF are derived with lead I and II. Some lead channel may be overlapped because of automatic centering for each lead. In this case, move the display timing position or change sensibility for confirmation the lead. ECG is expanded the waveform which is pointed out the position of the channel by double-clicked. Also the channel of the sub window changes to the channel indicated by double clicking. Timing value like an interval is measured by caliper which is appeared with push the left button of the mouse.

Note: Chest lead of ECG is displayed according to MFER recording. When V6R is recorded instead of V6 in MFER data, V6R waveform is displayed on the V6 display position.

(2). Full disclosure sub window

Full disclosure of selected ECG, which first channel ECG is displayed initially, is displayed on the sub window. The part of ECG is indicated with orange background color of sub window. When the ECG is pointed out on the sub window, the ECG at the time is displayed on the main ECG window(1). The ECG display is moved to the point which is dragged the cursor on the sub window. But the same function is executed by scrollbar when sub window is set to OFF.

(3). Cal. waveform display

The calibration waveform is display on the left side of the main window. When you click the cal. window, the sensibility of the ECG is changed to x1/2, x1 and x2, in sequence.

(4). Low pass filter

Low pass filter is change ON or OFF with clicking the "Hi Cut" area.

2. Expanded window

When a point of main ECG window is double-clicked, the channel of the pointed out ECG is expanded as four times on the main ECG window.

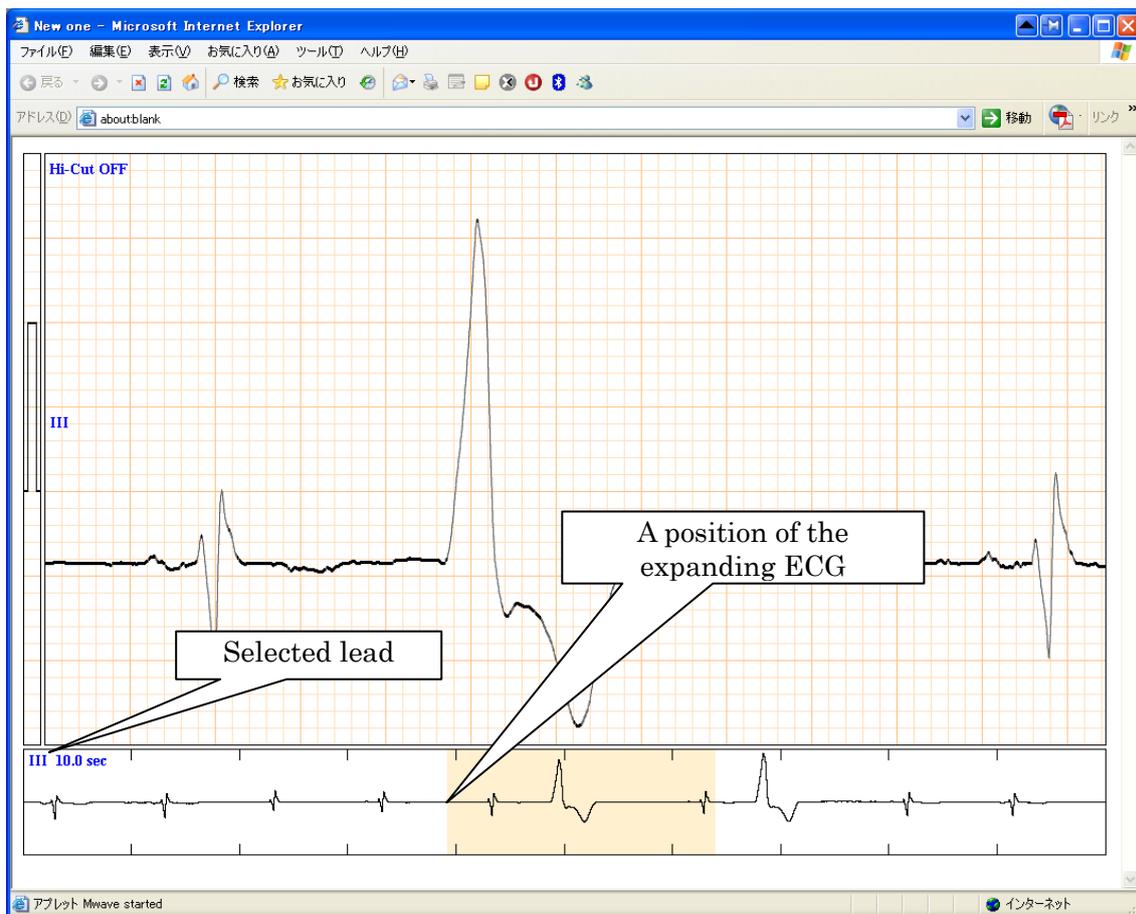


Fig. 2 Expanded ECG

The timing of the expanded ECG is represented with a cursor which is indicated orange color

on the sub window. The ECG can be moved by the cursor dragged on the sub window. Ordinary ECG window returns in double-click of the expanded window.

3. Measurement mode

There is two kind of measurement mode. One is caliper to measure duration of time, another one is a measure which measures time and voltage. The caliper is available on the main ECG window and the measure is used on the expanded ECG window.

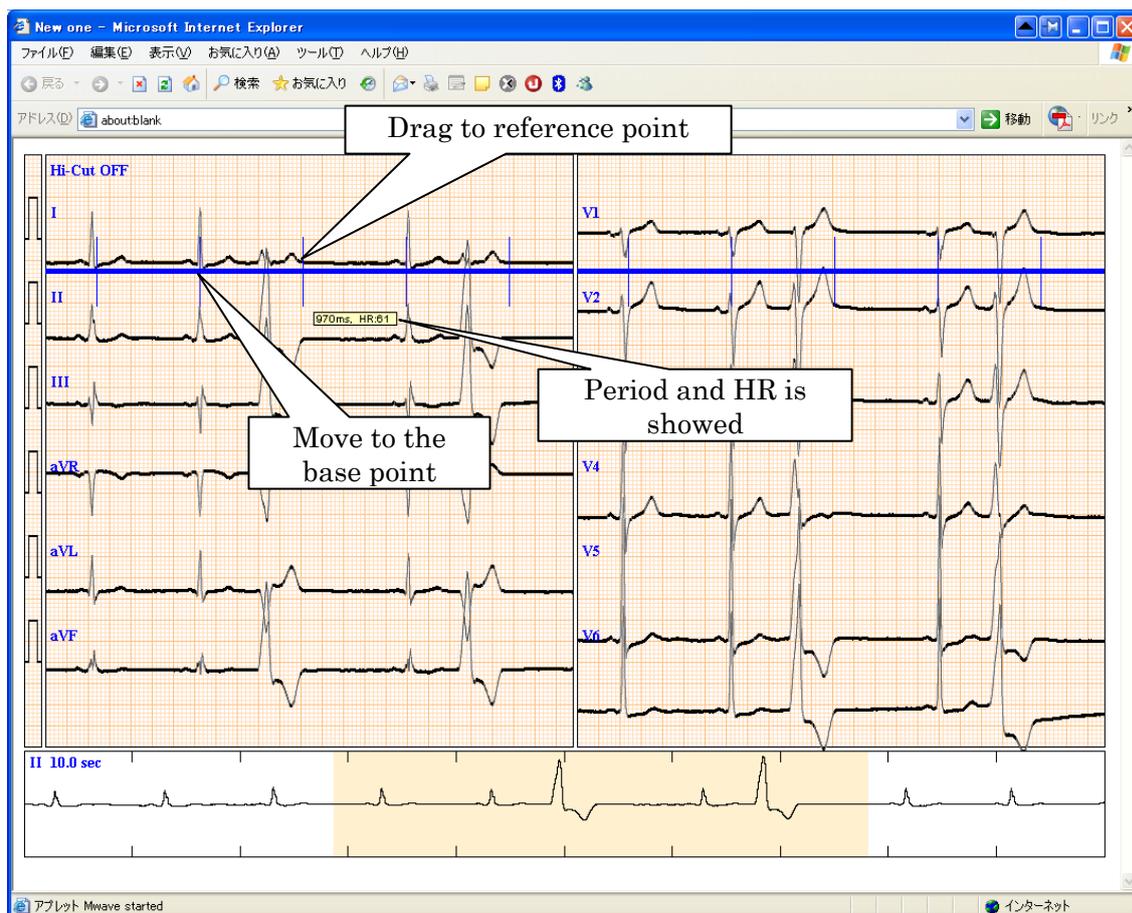


Fig.3 Caliper

(1). Caliper

The caliper is used to measure RR or PP interval on main ECG window.

[Operation]

- Move the mouse to appropriate position of the base point. Set to the mouse to QRS, for example.
- Push the button of mouse at the position pointed out.
- Move the mouse to a target point such as next QRS pushing button of the mouse, then release the mouse button. The caliper displays vertical scales which is each n

times. This is useful to grasp relation of the ventricular and atrial contraction such as compensatory pause, for example.

- d). The interval dragged two points is showed with blue color horizontal line and n times vertical lines, and display time interval and heart rate equivalent to the interval.
- e). Mouse drags with the blue horizontal line and moves to appropriate position to able to grasp the relationship between RR and PP interval.
- f). Single click of the mouse button disappears the caliper.

(2). Measure

The measure is used to measure the waveform value such as R amplitude, ST value, etc. on the expanded ECG window.

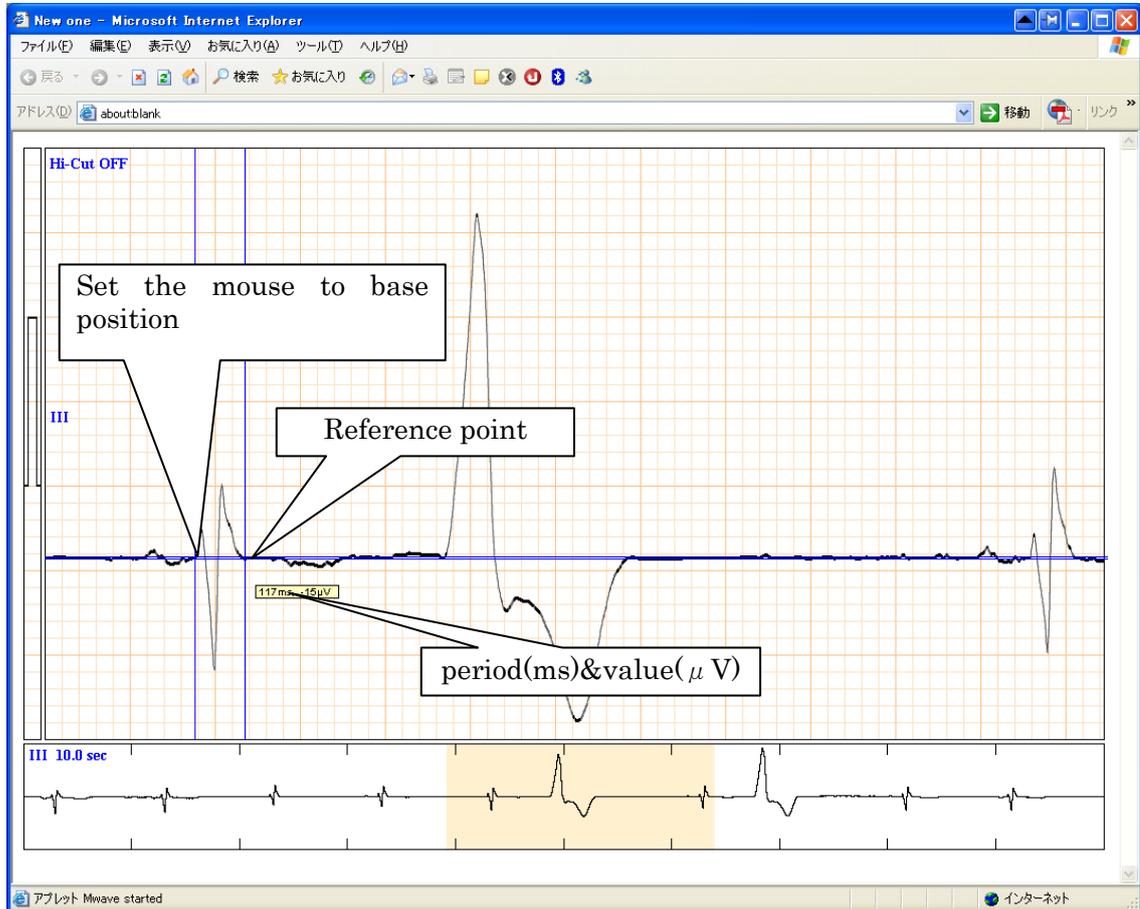


Fig. 4 Measure

[Operation]

- Move the mouse to the appropriate position on expanded ECG window and push the button of the mouse.
- Move the mouse and then horizontal and vertical blue line and numeric value is displayed voltage and time values between base position and moving point.
- Single click of the mouse disappears the measure lines.

4. Change sensitivity

Click the mouse button in calibration waveform area to change the sensitivity the x0.5, x1 and x2, in sequence.



Fig. 5 Sensitivity (This is x2)

5. Low pass filter

Low pass filter is set by push the mouse button at the "Hi-Cut" on the top left window. When electromyogram is mixed in ECG, the filter can remove the high frequency noise. The feature of the filter is that cut off frequency is 30 Hz of 2nd order Butterworth as an default. Since raw ECG is saved even if the filter set to on, original ECG is displayed when filter reset to Hi-Cut OFF.

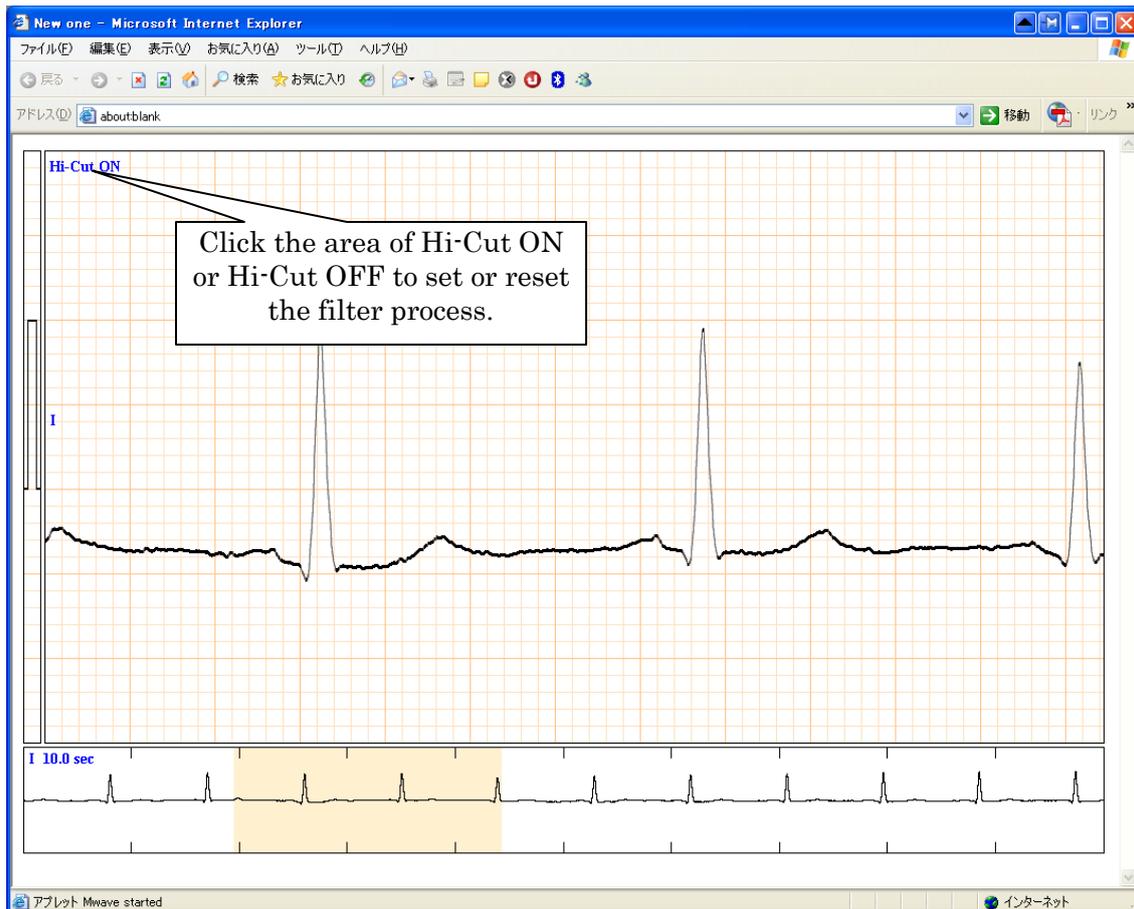


Fig. 6 Low pass filter ON/OFF

Note: When ECG is already processed by filter, "Filter:XXXX" is showed on the window. In this case, the filleted process is not able to be back by this viewer.