

VTLAB 2.3 User Guide

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Watch

Watch package

The package includes

1. smartwatch
2. band
3. USB cable

Connect the USB cable to a laptop or a 5v charger. Charge it for at least 2 hours.

Smartwatch

VT watch is a medical smartwatch that monitors several vital signs. The watch automatically measures continuous vital sign monitoring through the wrist. The watch comes with a charger and a cable. Please charge the watch by using these or any other **Qi-certified** charger.

Smartwatch Screen

After you plug the watch, the screen turns on and shows skin temperature, battery level, time, date and number of steps (as shown in fig.1).

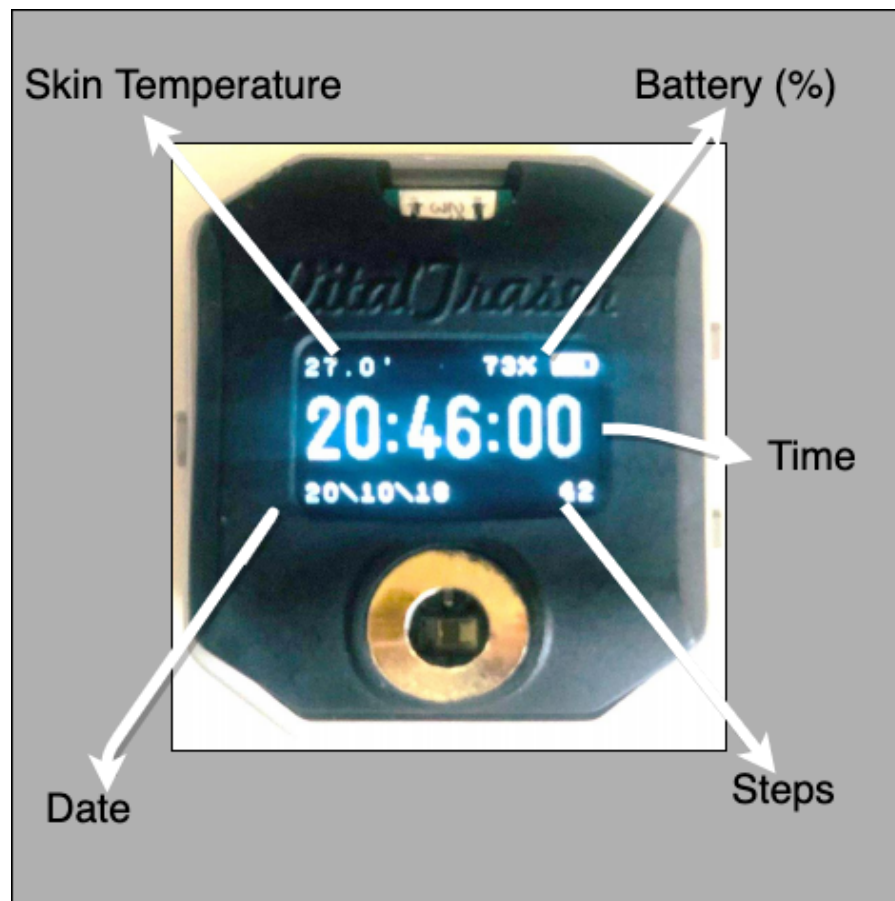


Figure 1: smartwatch main screen including skin temperature, battery level, time, date and number of steps.

Smartwatch Menu

Press the left button, you see the main menu items including:

- ECG front: Real-time ECG signal recording
- PPG back: Real-time PPG signal
- Steps: counts step
- Alarm: Reminders can be set.
- Temp: shows the skin temperature
- Accel: shows the acceleration in 3 axis
- Settings

Use buttons on the right side of the watch to move between these items. Use the button on

the left to select an item. In the following, we explain more about each item.

1. ECG front: Real-time ECG signal

The first item allows you to record your Real-time ECG signal and estimates your heart rate (HR) and the level of SPO2 in your blood. By selecting this item, the red light under the screen turns on. Put your index finger on the red light, as shown in Figure 2.



Figure 2: ECG recording. Select “ECG front” in the watch menu and put your index finger on the sensor. The watch shows the real-time ECG signal, HR and SPO2.

2. PPG back: Real-time PPG signal

The second item allows you to record your Real-time PPG signal and estimates your heart rate (HR) and the level of SPO2 in your blood. By selecting this item, the lights on the back of the watch turn on, as shown in Figure 3.



Figure 3: PPG recording using the rear by selecting this item. Select “PPG back” in the watch menu. Then, the watch shows the real-time PPG signal, HR and SPO2.

3. Steps: counts step

This section shows your walking details. See figure 4.



Figure 4: steps. The step section in the menu shows the number of steps, **max number of steps per hour** and hourly graph.

4. Water

The water section shows the number of glasses you drink per day. You can edit the number by using the right up/down button. See figure 5.



Figure 5. The water menu. This shows how much you drink per day. You can edit the number by using the right up/down button.

5. Alarm

Use this option to set a reminder. See figure 6.



Figure 6. Alarm. In this menu, you can set a reminder.

6. Temp

This section shows the skin temperature in real-time. See figure 7.



Figure 7. Temperature. Measures and shows the skin temperature in real-time.

7. Accel

This menu shows the acceleration in 3 axes. As shown in figure 8, this menu shows the position of the watch by a dot and values in the 3D environment.



Figure 8. Acceleration sensor. The acceleration menu shows the position of the watch by a dot and values on the 3D axis.

8. Settings

Here you can change some settings of the watch, including:

a. Time

Set the time.

b. Date

Set the date.

c. Bluetooth

Bluetooth could be updated.

d. SerialNum

The serial number show here in case there are a couple of devices to identify the device.

e. Format SD

The SD memory card will be formatted, and the watch will be restarted.

f. Reset

The smartwatch will be reset, all data will be deleted, and steps will be zero.

Update watch firmware

The watch firmware improves permanently. You can update it using the VTLAB desktop. See [watch update](#) for details. You can report bugs or request new features [here](#).

VTLAB desktop APP

Our desktop app provides different tools to visualize and analyze the recorded signals. It is also an interface to the watch and can update the watch firmware. To start with the software, you need to install it on your computer. To download it go to the following link:

<https://gitlab.com/mohsen.sadi/vtlab-desktop-app>

Download “Setup VTLab.exe” and install the app. It will create a shortcut on the desktop. Click on the icon and run VTLab as administrator. After the app is open, select the folder that contains your recorded file.

Note: The watch saves all the recording on its SD card. You can connect the watch to your computer to view the files and copy them.

File visualization panel

Select a file of your choice. You should see the recordings as shown in figure 7:



Figure 7. Graphical User Interface

In the right menu, you can select folders and files you want to analyze. In the right down, you can choose different recordings and normalizations. In more detail, this window includes:

1. Show the collected signals
2. Pause the collected signals
3. Stop and go back to the beginning
4. Select the folder that the data are transferred from the watch
5. Data files are shown in this box
6. Signals are shown in this box
7. Signal Cursor: Shows 100% of the data with respect to time

8. View Width: The width of displayed data could be customized here. Larger width results in more data shown in the display.
9. Speed: Increase or decrease the speed of the displayed signals.
10. Fullscreen the display

Analyze panel

On the “Analyze panel” you can see other tools to analyze the signal. See figure 8.

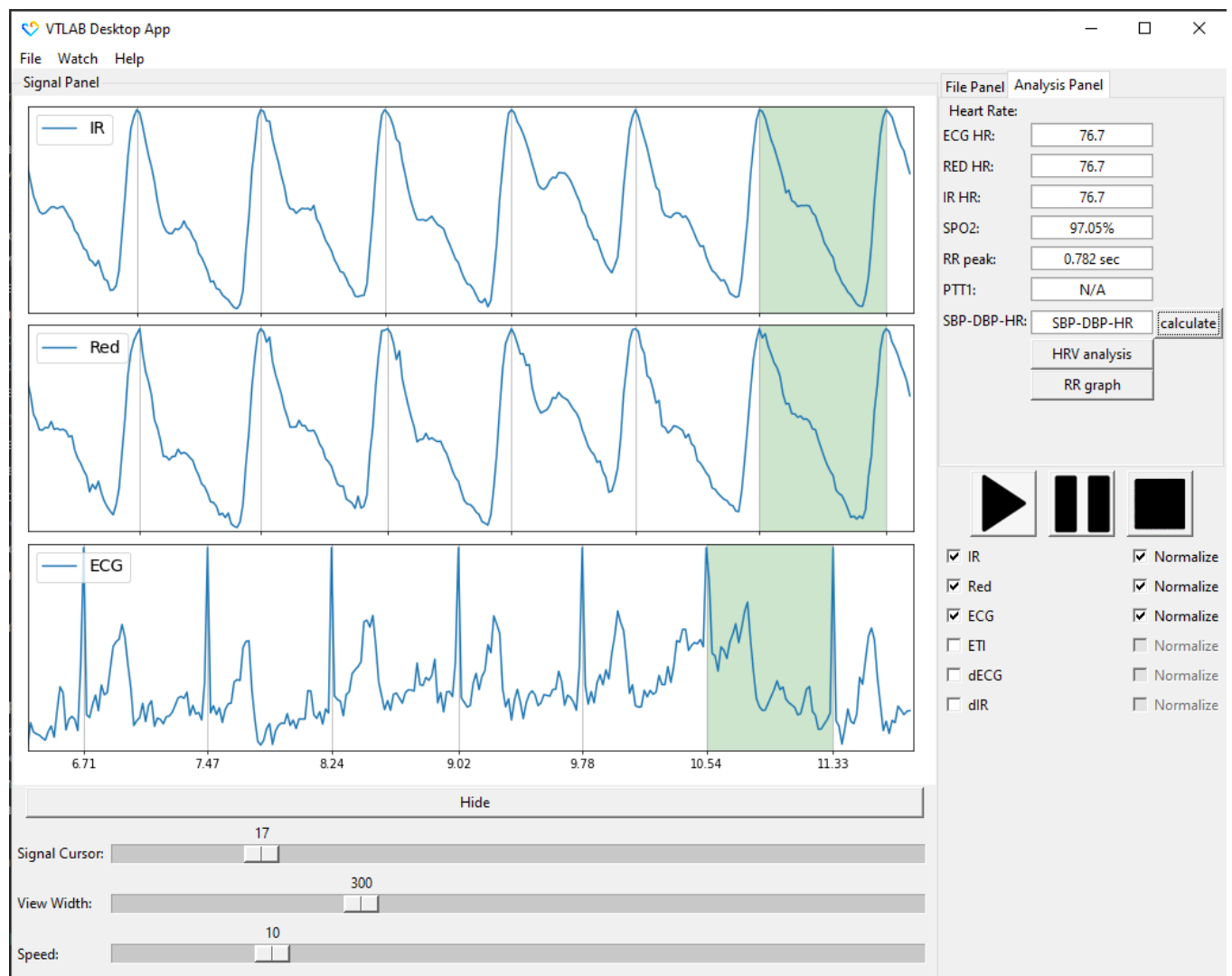


Figure 8. Analyze panel including heart rate, SPO2, blood pressure estimation.

As shown in figure 9, in the file menu you can save or export the analysis or exit the app.

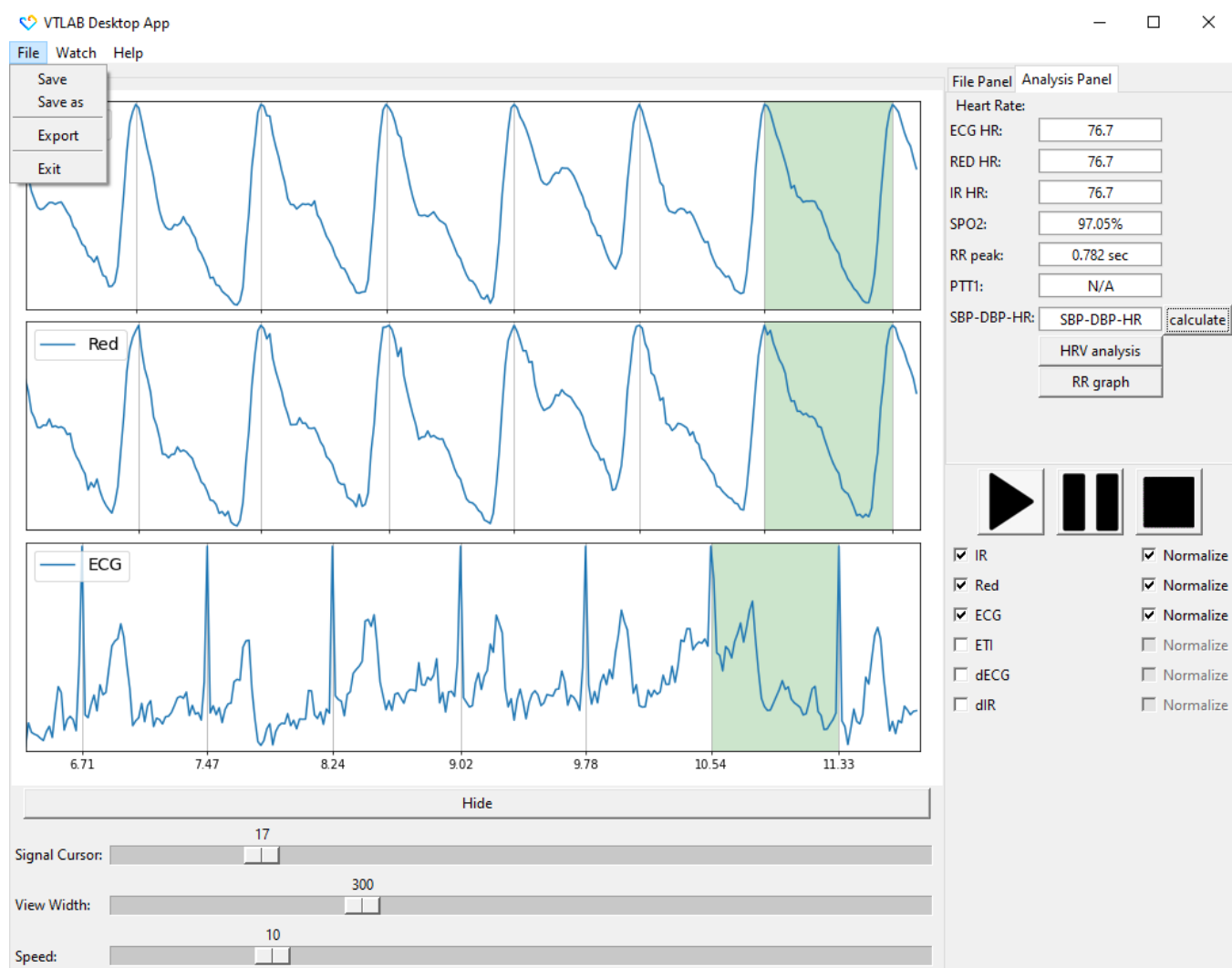


Figure 9. The file menu

Watch update

In the watch menu, you can update the watch firmware. To do so, follow the instruction as shown in figure 10.

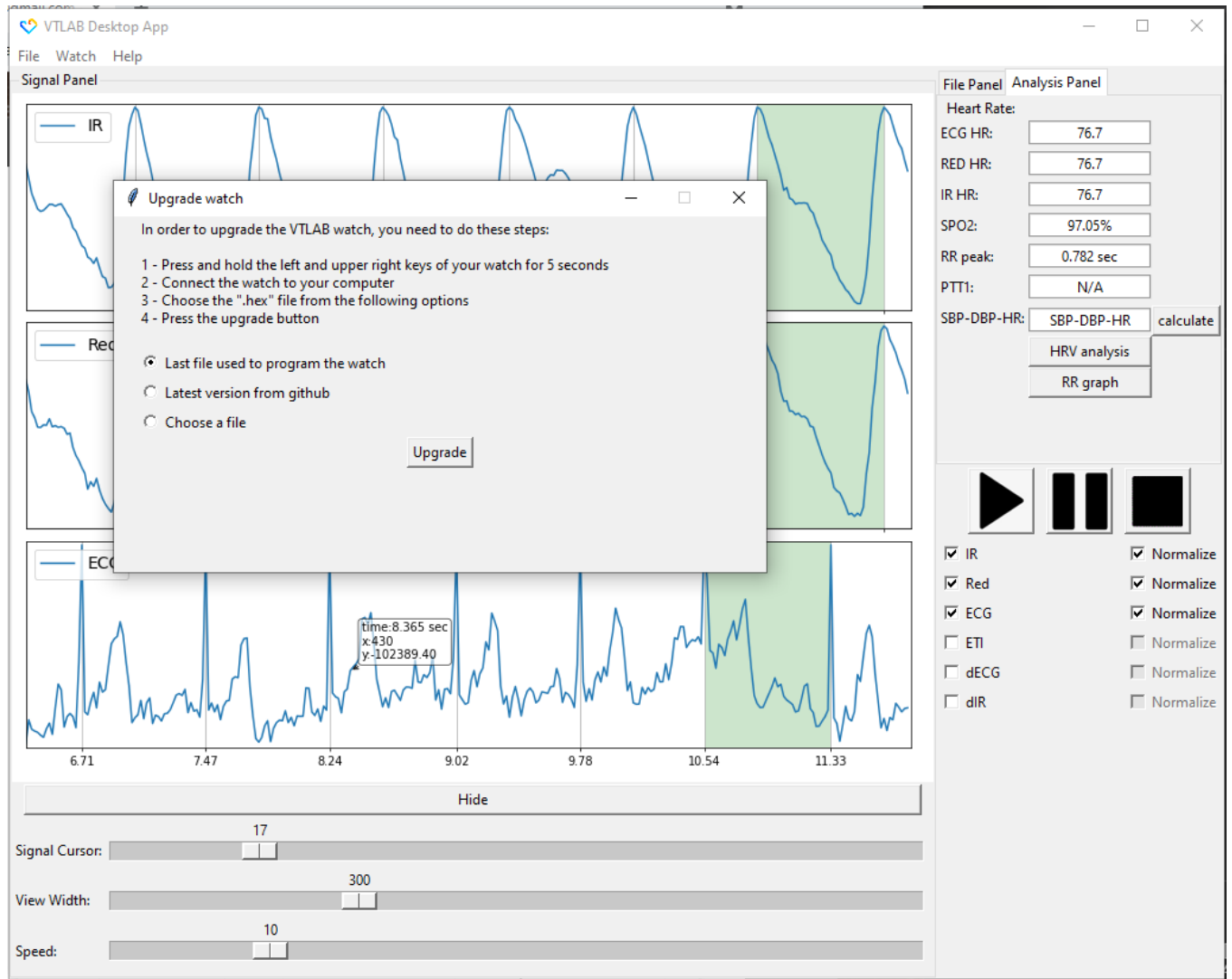


Figure 10. Update the watch firmware

Version information

On the help menu, click on the "About" option to see the version of the desktop app. See figure 11.

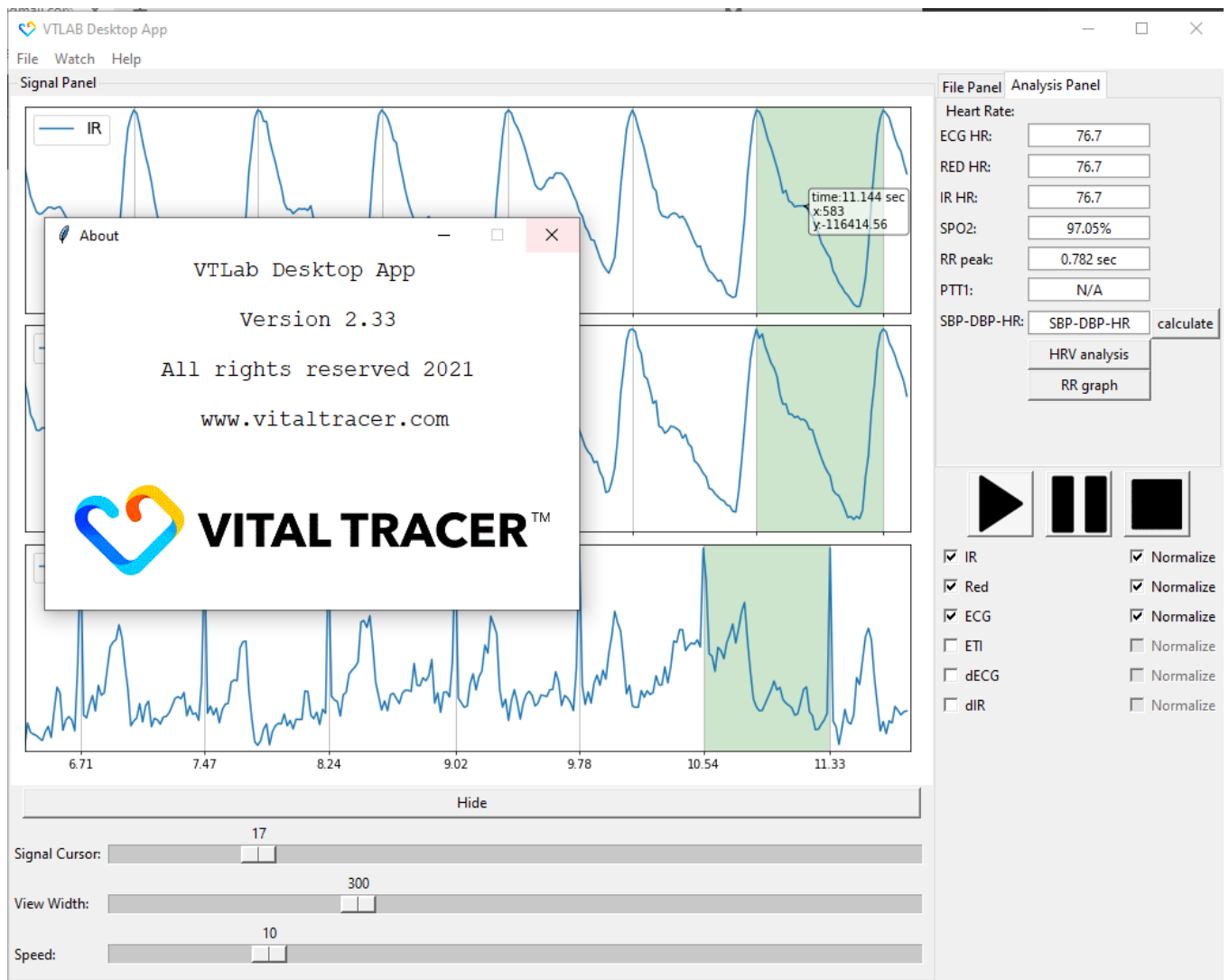


Figure 11. About the software.

Keyboard Shortcuts

- Pause/play "P"
- Move forward ">"
- Move backward "<"
- Stop "S"

FAQ