



# **T-ECG doctor**

## User Manual

For iPhone and iPad Version

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## 1 Legal Notice

### 1.1 Trademarks Information

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### 1.2 Safety and Privacy

Only health professionals should use T-ECG Doctor. The program doesn't use or need any personal (private) data to be functional. The user is responsible for compliance with the privacy rules in force in each country.

## 2 Information notes

Read this chapter for information on system requirements, limitations, appropriate use and compatible devices.

### 2.1 Manual

This manual is intended for all users who want to learn how to use T-ECG. It explains how to achieve the desired objectives through detailed procedures.

### 2.2 Application

T-ECG is an application created to support transtelephonic ECG devices with enriching features such as display of ECGs, archive patients ECGs, data exchange by email and report generation.

### 2.3 Mobile system requirements

T-ECG runs on iPhone and iPad with iOS 4.3.5 and up Operating Systems.

## 2.4 Technical specifications

<b>Signal Demodulation</b>	<ul style="list-style-type: none"> <li>• Type: FM</li> <li>• Center frequency: 1900 HZ</li> <li>• Modulation rate: 100 HZ/mV</li> <li>• Max. deviation: <math>\pm 250</math> HZ</li> </ul>
<b>Leads</b>	<ul style="list-style-type: none"> <li>• Lead separation: 1 mV pulse of 0.1 s. with front and back porch.</li> <li>• Lead duration: 10 seconds for Rhythm and 2.5/4/10 s. for the others. Automatic detection of lost leads or incorrect duration time.</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>• Reference signal pulse: 1 mV, 0.1 s</li> <li>• Horizontal division: 0.2 s</li> <li>• Vertical division: 0.5 mV</li> <li>• Horizontal scrolling view in detailed mode. Zoom in/out in PDF mode.</li> </ul>
<b>Patient record</b>	Name, Surname, Age, Sex, Notes and Diagnostic
<b>Doctor Data</b>	Name, Surname and Prof. ID, graphic signature.
<b>Report format</b>	PDF format , 2 pages.
<b>XML file data</b>	<ul style="list-style-type: none"> <li>• File format: UTF-8 XML</li> <li>• Patient data: uncompressed UTF-8</li> <li>• ECG signal data <ul style="list-style-type: none"> <li>• Format: signed 16 bit PCM</li> <li>• Compression: lzip</li> </ul> </li> <li>• Encode: Base64</li> </ul>

## 2.5 Transtelephonic devices supported

T-ECG decodes the following devices audio signals:

- Aerotel HeartView LIIx10 + 12x2.5/4
- Cardiette Microtel 12x2.5 /LII x10
- Cardiette Microtel 12x10
- Other devices with same audio signal play back as one of the above.

## 2.6 Limitations and proper use

1. This software demodulates and digitalise the audio signal of 12 leads transtelephonic ECG devices.
2. The audio recording must be done in a noiseless environment.
3. Only cardiologist doctors can interpret or diagnose the chart.
4. The ECG acquisition must be done only by health care operators.

## 2.7 Language

At the moment T-ECG is only available in English

## 2.8 Version

This manual applies for T-ECG Doctor ver. 1.2 for iOS.

### 3 Introduction

Read this chapter to learn how to configure T-ECG and set the type of device you will work with.

#### 3.1 Launch T-ECG

At launch T-ECG, the program displays the Home screen (see Fig.1).



Fig. 1

1. **Doctor** button: to set the Doctor data and signature.
2. **About** button: to get program information and support.
3. **Browse** button: to browse the list of archived ECGs.
4. **Record** button: to record a new ECG from a transtelephonic device.

## 3.2 Configuration

The first thing to do, as a doctor, if you want to identify and sign the charts, is to set your professional data and signature. You need to do this only once or when you data changes

### 3.2.1 Doctor identification

Tap on Doctor button from the Home screen (see Fig. 1, button 1);



Fig. 2

Fill the Name, Surname and ID fields on the Doctor screen.

### 3.2.2 Signature registration

You must register your signature if you want the exported documents (pdf) to be signed.

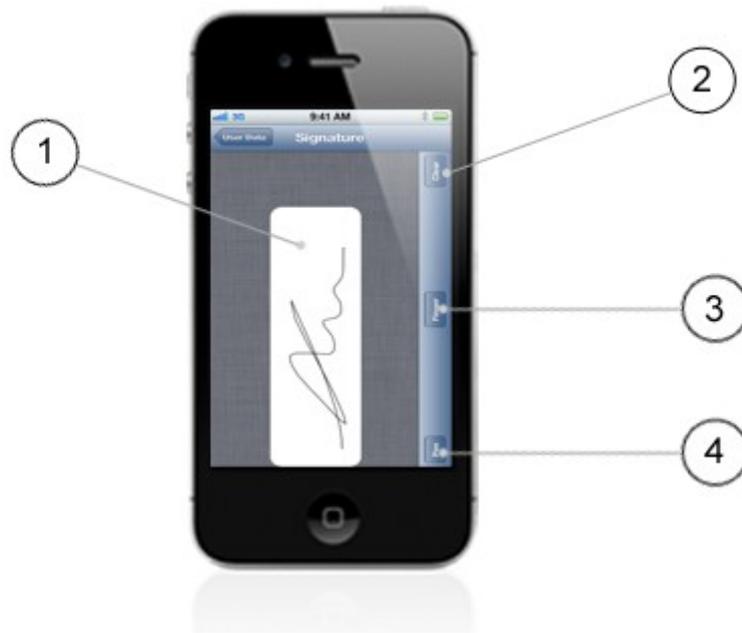


Fig. 3

1. **Signature** drawing frame. Draw your signature directly on the screen with your finger (or a appropriate pen);
2. **Clear** button: clears completely the drawing frame;
3. **Finger** button: to sign using your finger ;
4. **Pen** button: to sign with a pen.

### 3.3 Setting the device type

The audio signal generated by the transtelephonic devices can be different from model to model; lead duration, center frequency/deviation and markers. Consult the technical data of your transtelephonic device about the audio format(s) it supports.

- Tap on Record button from the Home screen (see Fig. 1 button 4);

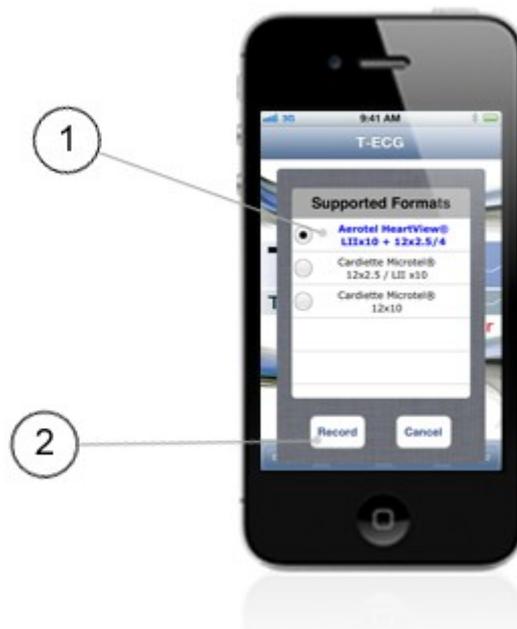


Fig. 4

1. List of supported formats
2. Record button: to start the recording

### 3.4 Operation

After you acquire the ECG with the transtelephonic device:

1. Launch T-ECG
2. Tap the Record button from the Home screen (see Fig. 1 button 4);
3. Select the format (if not already set as default) compatible with the device you used to acquire the ECG (see Fig. 4 list 1)
4. Tap the Record button (see Fig. 4 button 2) to start recording.
5. Start the audio signal play back on the transtelephonic device.
6. Wait for the end of recording (see Fig. 5);
7. After the end of the recording process, if successfully, the Patient screen will be open automatically.



Fig. 5

The recording process may abort if T-ECG cannot identify all leads correctly. Normally it display the probable error: incorrect lead duration, incorrect number of leads, etc.

Errors can be originated by: a noisy/bad quality recording of the transtelephonic device, ambient noise when playing back, incorrect device placement (too far, or too near from the mobile mic), incorrect device format setting.

## 4 Patient ECG interface

### 4.1 Patient Record

After the recording operation is finished, enter the patient data on this screen (see Figure 6). Every time you save a new recording chart you have to enter the patient data, even if you have done it before in a previous ECG. T-ECG is a ECG oriented database not Patient oriented.

The patient screen opens automatically after the successful recording of the ECG, otherwise you can access it from the Browse button (see Figure 7).

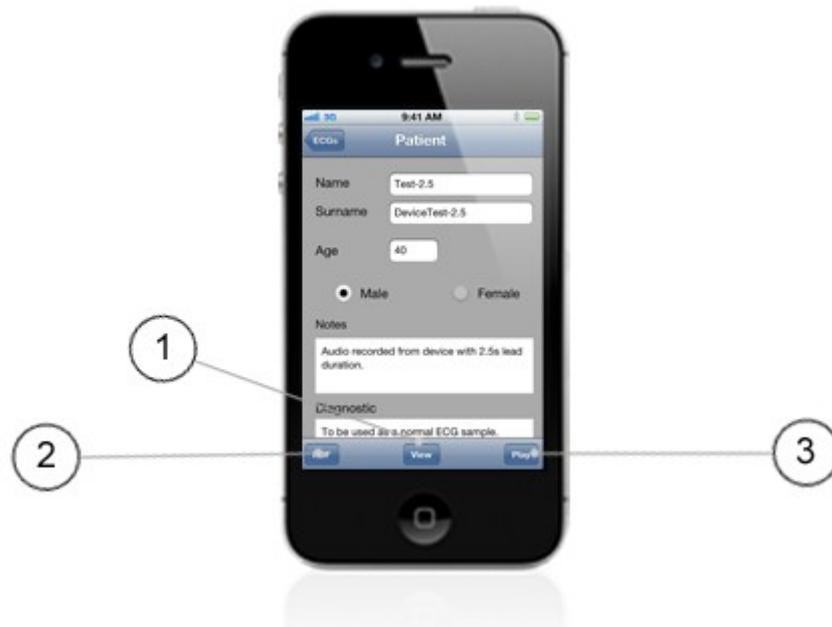


Fig. 6

1. View ECG button: to open the ECG chart viewer.
2. PDF button: to view the PDF report.
3. Play button: to playback the audio signal

## 4.2 ECG Browser

It displays the list of ECG already recorded on the mobile. You can change the order criteria from Name to Date, ascending or descending, with the buttons (see Figure 7, buttons 2, 3)

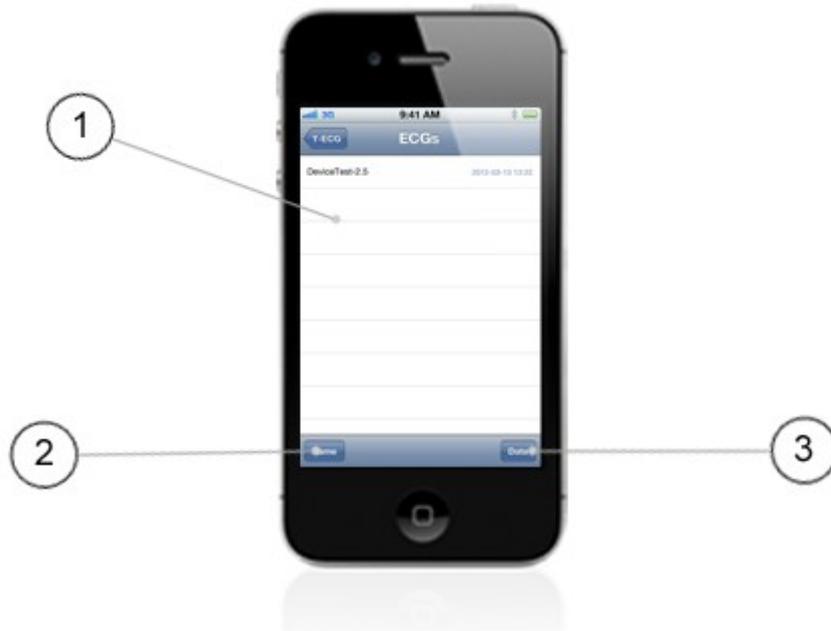


Fig. 7

1. ECG list: list of recorded ECG;
2. Name button: to order the list by patient surname, successive taps change from ascending to descending order and vice versa.
3. Date button: to order the list by date of recording (default) successive taps change from ascending to descending order and vice versa.

### 4.3 ECG viewer

Tap on this button to see the 12 leads ECG chart in 3x4 + Rhythm format (see Figure 8).



Fig. 8

Tapping on a lead sector will open a detailed view of the lead (see Figure 9).

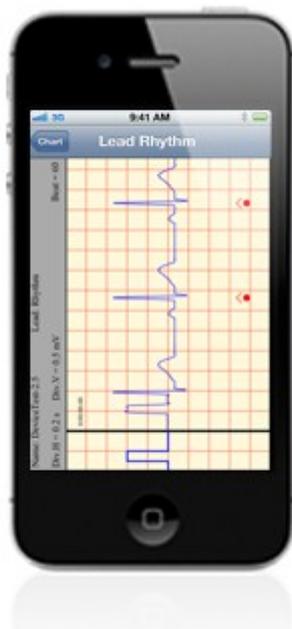


Fig.9

The lead detail view can be scrolled if the lead time is longer than the time that fits in the screen.

#### 4.4 ECG PDF report

Tap on the PDF button on the Patient screen. The PDF report will be generated and displayed (see Figure 6, button 2).

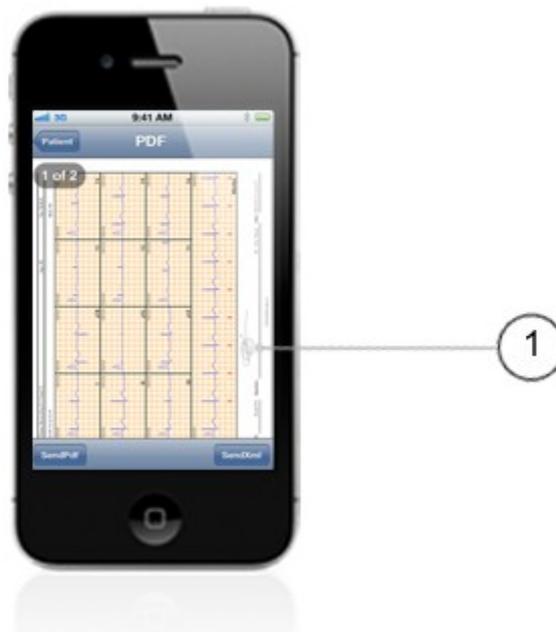


Fig. 10

1. Signature

## 5 Send and receive ECGs by mail

Tap on PDF button from the Patient Record (see Fig. 6, button 2);



Fig. 11

1. Button SendXML: attach the XML file to the mail;
2. Button SendPDF: attach the PDF file to the mail

You need to have a valid mail account set on your device and be connected to internet to send the mail with the attachment(s).

### 5.1 Send PDF

You can send the PDF report when you finished the interpretation of the chart and all the patient data is filled.

- On the Patient screen tap on the PDF button (see Figure 6, button 2).
- Tap on SendPDF Document (see Figure 11, button 1).
- The mail composition screen will be open. Compose the mail normally and send it; the PDF file is already attached to the mail.

## 5.2 Send XML file

The XML file contains all the patient and signal data. It can be exported (sent as an attachment in a mail) or imported from a mail attachment by other device with T-ECG Doctor installed.

- On the Patient screen tap on the PDF button (see Figure 6, button 2).
- Tap on SendXML Document (see Figure 11, button 2).
- The mail composition screen will be open. Compose the mail normally and send it, the XML file is already attached to the mail.

This option allows to T-ECG User users to send the ECG to be interpreted by a Doctor using T-ECG Doctor or to exchange ECGs between doctors.

T-ECG User version doesn't allow to generate PDF files it only can send XML files to T-ECG Doctor users.

## 5.3 Receiving a XML file

The T-ECG XML file arrives as an attachment in a mail. From the mail inbox viewer program open the attachment (view or save). T-ECG Doctor will be opened, and after the import process, will display the Patient screen automatically.

If there is other xml reader/viewer app registered on the mobile, you must choose T-ECG Doctor as the app to complete the operation.

## 6

## 6 T-ECG audio play back

T-ECG can re-modulate the ECG signal in the same audio format as it was recorded. This function allows to transmit in acoustic mode the recorded ECGs to cardiologist receiving station as usually is done directly with the transtelephonic device.

- Tap on Play button in Patient screen.
- Once the audio file is generated
  - Call the receiving station as usual
  - Tap play button on T-ECG screen
  - wait until the audio finish, you will see a progress bar indicating the time remaining to play
  - End the phone call with the receiving station
- Done



Fig. 12