
DOCTOR MANUAL

LungLink doctor application

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1. INTRODUCTION

The LungLink Doctor application enables healthcare professionals to remotely monitor patients with chronic respiratory issues. Through this platform, doctors can access patients' symptoms, examine uploaded physiological signals (ECG and EMG), analyze their medical history, and document clinical observations.

The doctor's client communicates with the hospital server using the same structured protocol as the patient client, ensuring that every action is securely handled and recorded in the hospital database.

2. STARTING THE APPLICATION

2.1. *How to initialize the application*

To initiate the doctor platform, launch the doctor application and provide the server's IP address. If both applications have the same port and a valid IP address is provided, a successful connection will be established between the doctor and the server, and the system will present a welcome menu where the user can choose to either register or login if he/she already has an account.

```
Enter Server IP (for example 192.168.1.44 or localhost): localhost
Attempting connection to localhost...

Connected to server.

WELCOME TO LUNGLINK
1. Register user
2. Login user
3. Exit
Choose an option: |
```

2.2. *Sign up / Register*

The first time the doctor uses the system, must create an account. This process requires the doctor to set a username and a password.

```
REGISTER USER
New username: PaulaGarcia
New password: 12345
User created. ID = 13

Checking if you already have a doctor profile...
No doctor profile found. Let's create one.
```

When submitted, the data is sent to the server, which creates the new account, stores the user data in the database (password is stored with encryption) and returns the associated user ID.

2.3. *Log in*

Existing users can log into the system by providing their username and password. If the credentials are valid, the doctor receives permission to proceed to the next phase of the application.

If wrong, the system prompts the user to retry.

```
LOGIN USER
Username: PaulaGarcia
Password: 12345

Checking if you already have a doctor profile...
Loaded doctor profile for: Dr. Paula García
```

2.4. *Doctor profile configuration*

The required doctor information includes name, surname, email and medical specialty (Cardiologist, Neurophysiologist, General Medicine).

Once confirmed, the server creates the patient record in the database and the application proceeds with the doctor menu.

If the profile already exists, the application automatically retrieves the stored information, and the doctor is taken directly to the main menu.

```
Checking if you already have a doctor profile...
No doctor profile found. Let's create one.

CREATE DOCTOR PROFILE
Name: Paula
Surname: García
Email: pgarcia@gmail.com
Specialty:
1. CARDIOLOGIST
2. NEUROPHYSIOLOGIST
3. GENERAL MEDICINE
Choose by typing the number: 1
Doctor profile created. ID = 6
```

2.5. *Exit*

If the user realizes he does not want to enter the application, he can exit and the application will immediately disconnect from the server.

Selecting this option closes the session currently going on: the user sends a disconnect command to the server, all resources are released, and the program ends safely.

Furthermore, if the server shuts down unexpectedly, the doctor is notified, and the client closes automatically.

```
WELCOME TO LUNGLINK
1. Register user
2. Login user
3. Exit
Choose an option: 3
Doctor disconnected.
```

3. MAIN DOCTOR FUNCTIONALITIES

Once the profile is loaded, the doctor can use all the systems features. The menu allows the doctor to view assigned patients, access patient history, review physiological signals (ECG/EMG), add observations or disconnect.

```
DOCTOR MENU

1. View my patients
2. View patient history
3. View patient signals
4. Add observation
5. Disconnect

Choose option: |
```

3.1. *View my patients*

The system displays the list of patients assigned to the doctor. Tasks are managed automatically by the server depending on specialty and workload.

```
DOCTOR MENU

1. View my patients
2. View patient history
3. View patient signals
4. Add observation
5. Disconnect

Choose option: 1

PATIENT LIST

ID: 8 | Name: Victoria Martínez | DOB: 12-6-1998 | Sex: FEMALE | Mail: victoria@gmail.com
```

3.2. *View patient history*

The doctor can see all medical history entries recorded by a specific patient, including the date of submission, reported symptoms, any associated ECG or EMG files, and previous medical observations. This data is obtained directly from the database.

```
PATIENT LIST

ID: 8 | Name: Victoria Martínez | DOB: 12-6-1998 | Sex: FEMALE | Mail: victoria@gmail.com

Enter the ID of the patient you want to see (or 0 to cancel): 8
RECORD_ID: 15
DATE: 2025-11-29
TYPE: ECG
FILE: ECG_record15.csv

RECORD_ID: 16
DATE: 2025-11-29
TYPE: SYMPTOMS
SYMPTOMS: headache,chest pain

RECORD_ID: 17
DATE: 2025-11-29
TYPE: ECG
FILE: ECG_record17.csv
```

3.3. *View physiological signals (ECG/EMG)*

The doctor can access and examine every physiological signal via a visual display. The system shows the ECG or EMG recording as an image created from the samples collected by the BITalino device throughout the monitoring session.

```
Choose option: 3

PATIENT LIST

ID: 8 | Name: Victoria Martínez | DOB: 12-6-1998 | Sex: FEMALE | Mail: victoria@gmail.com

Enter the ID of the patient you want to see (or 0 to cancel): 8

Available signals for this patient:

SIGNAL_ID: 9
TYPE: ECG
FILE: ECG_record15.csv

SIGNAL_ID: 10
TYPE: ECG
FILE: ECG_record17.csv

Enter SIGNAL_ID to download/open (or 0 to cancel): 9
File downloaded at: C:\Users\MARTIN~1\AppData\Local\Temp\signal_16398306406375719337.csv
PNG generated at: C:\Users\MARTIN~1\AppData\Local\Temp\signal_9879899483549325410.png
```

A visual .png format of the signal will be automatically displayed in the doctor's application.

3.4. Add Observation

For any medical history record, the doctor can add a clinical note. The observation is sent to the server and permanently stored with the corresponding medical entry.

```
DOCTOR MENU

1. View my patients
2. View patient history
3. View patient signals
4. Add observation
5. Disconnect

Choose option: 4

PATIENT LIST

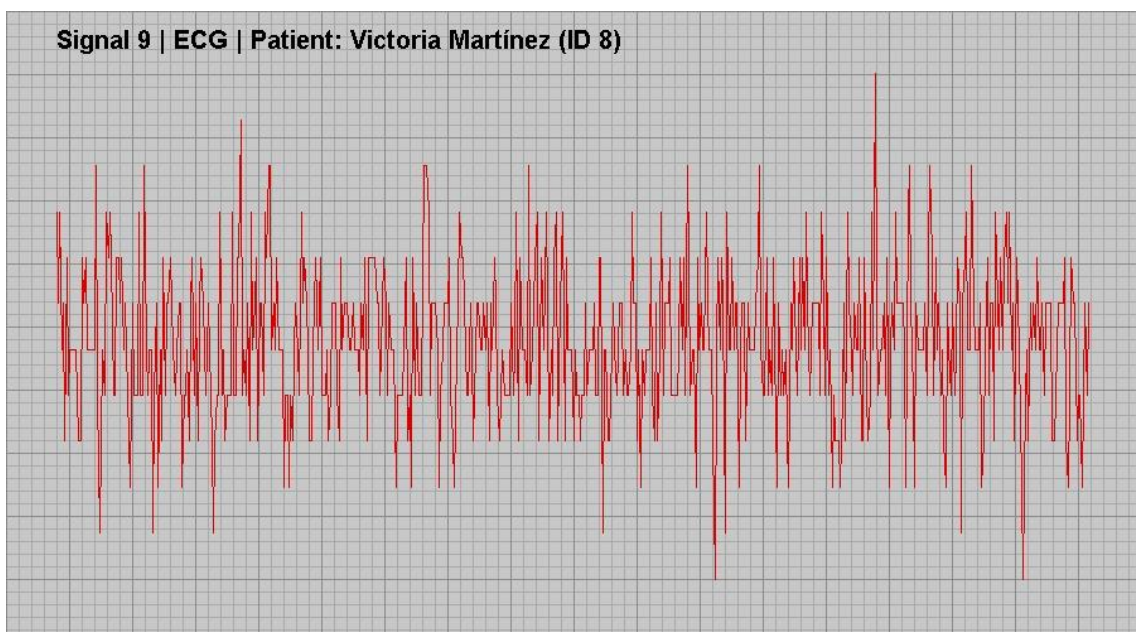
ID: 8 | Name: Victoria Martínez | DOB: 12-6-1998 | Sex: FEMALE | Mail: victoria@gmail.com

Enter patient ID to observe: 8

Available medical histories for this patient:
RECORD_ID: 15
RECORD_ID: 16
RECORD_ID: 17

Type the RECORD_ID in which you want to make any observation: 15
Observation to add: tachycardia
SERVER: OK|Observation added
Observation added successfully.
```

A visual .png format of the signal will be automatically displayed in the doctor's application.



3.5. *Disconnect*

Selecting this option closes the session currently going on: the doctor sends a disconnect command to the server, all resources are released, and the program ends safely. If the server shuts down unexpectedly, the doctor is notified, and the doctor closes automatically.

```
DOCTOR MENU

1. View my patients
2. View patient history
3. View patient signals
4. Add observation
5. Disconnect

Choose option: 5
Doctor disconnected.
```