



USER'S MANUAL

CPR Electronic Mannequin Assistant

Engineering Health Solutions

May, 2009

Revision Sheet

Release No.	Date	Revision Description
Rev. 1	5/03/00	User's Manual Template and Checklist (draft for end of phase 3)



User's Manual Authorization Memorandum

I have carefully assessed the User's Manual for the CPR eTAM. This document has been completed in accordance with the requirements of the ICOM5047 course.

MANAGEMENT CERTIFICATION -

_____ The document is accepted.

X The document is accepted pending the changes noted.

_____ The document is not accepted.

We fully accept the changes as needed improvements and authorize initiation of work to proceed.

Jomar Rosario
NAME
Project Leader

DATE

Edvier Cabassa & Juan Gorritz
NAME
Software Department

DATE

Arelis Perez & José Lombay
NAME
Hardware Department

DATE

Frank Mendoza
NAME
Client

DATE

Silicon Labs
NAME
Sponsor

DATE

USER'S MANUAL

TABLE OF CONTENTS

	<u>Page #</u>
1.0 GENERAL INFORMATION	1-1
1.1 System Overview	1-1
1.2 Project References	1-2
1.3 Authorized Use Permission	1-2
1.4 Points of Contact	1-2
1.4.1 Information	1-2
1.4.2 Help Desk	1-2
1.5 Organization of the Manual	1-3
1.6 Acronyms and Abbreviations	1-3
2.0 SYSTEM SUMMARY	2-1
2.1 System Configuration	2-1
2.2 Data Flows	2-5
2.3 User Access Levels	2-8
2.4 Contingencies and Alternate Modes of Operation	2-8
3.0 GETTING STARTED	3-1
3.1 Logging On	3-1
3.2 System Menu	3-1
3.2.8 Test USB data transfer	3-6
3.2.9 Tutorials.....	3-7
3.2.10 Training.....	3-12
3.3 Changing Password	3-14
3.4 Exit System	3-14
4.0 REPORTING	4-1
4.1 Report Capabilities	4-1

1.0 GENERAL INFORMATION

1.0 GENERAL INFORMATION

1.1 System Overview

Cardiopulmonary resuscitation (CPR) is a procedure used with unconscious victims of some type of trauma which has caused the heart to stop beating in order to simulate a functional heartbeat and oxygen intake through breathing. Currently, CPR training is usually performed using a mannequin and supervised by an instructor. We improve the quality of the training process to perform CPR creating a tool to facilitate the job of the instructors by electronically monitoring students practicing CPR on a training mannequin. Our product consist of a mannequin that will be monitored using different sensors and a software application which retrieve and process the information in order to provide proper training and support the instructor. The mannequin simulates a person who needs CPR and responds to the steps if they were applied according to the rules of the CPR manual or instructor. The trainer use software installed in a normal computer to control the mannequin's actions and obtain results of his or her students in real time, with the ability to save the data or retrieve previous session data from a database.

1.2 Project References

- [1] Thygerson, A. (2005). *First aid, CPR, and AED, 4th ed.* Jones and Bartlett: Sudbury, Massachusetts.
- [2] National Safety Council. (1999). *Heartsaver facts: First aid, AED, CPR training system.* Jones and Bartlett.
- [3] National Safety Council. (1997). *CPR for the professional rescuer.* Jones and Bartlett.
- [4] Jones, A. (2003). *C# for Java developers.* Microsoft Press.
- [5] Microsoft Corporation. (2002). *Microsoft visual C# .NET: Language reference.* Microsoft Press: Redmond, WA.
- [6] Obviex. (2009). *How to: Encrypt and decrypt data using a symmetric (Rijndael) Key (C#/VB.NET).* Retrieved February 10, 2009 from <http://www.obviex.com/samples/Encryption.aspx#>

1.3 Authorized Use Permission

Only the people that acquired the system through our company and agree with the following terms are authorized to utilize it:

“This product in no way, shape, or form intends on replacing conventional, professional teaching of CPR procedures. Its only intention is the facilitation of teaching and evaluating CPR students. Proper use of the product does not imply that the user will be certified to give CPR.

It falls under the responsibility of the instructor to take into consideration the legal aspects concerning CPR instruction and performing CPR.”

1.4 Points of Contact

1.4.1 Information

Engineering Health Solutions is a group that intends to bring solutions to problems that involves the health and safety. We spec to solve issues that can do the difference in the life of many people.

1.4.2 Help Desk

For emergency assistance please contact EHS by this email: engineering.health.solutions@gmail.com.

1.5 Organization of the Manual

Provide a list of the major sections of the User's Manual (1.0, 2.0, 3.0, etc.) and a brief description of what is contained in each section.

1.6 Acronyms and Abbreviations

CPR eTAM – CPR Electronic Teaching Assistant Mannequin

EHS – Engineering Health Solutions

CPR eTAM app - CPR eTAM software

2.0 SYSTEM SUMMARY

2.0 SYSTEM SUMMARY

CPR eTAM is a mannequin monitored and controlled by sensors, a microprocessor, and computer software in a personal computer to simulate the steps performed in a CPR rescue session. This tool facilitates the job of the instructors by electronically monitoring students practicing CPR on a training mannequin. We provide the hardware and software to identify when a student is not following the correct procedure; monitoring chest compressions, the victim's breathing and pulse, and the position of the victim's head using specialized software to configure the mannequin and display the data provided from the real time situation in the mannequin.

The CPR eTAM app can be divided into three principal modules: How To, Training and Setting. Between all those modules, it allows the user to create an account, manage student information, run training sessions to evaluate and train students, and store results of those sessions. The user is able to change the evaluation metrics used in the program to evaluate the student at the training session.

In order for the system to perform everything mentioned above, you need to have a 120VAC wall plug, 4xAA batteries, and a computer with a usb port connector.

2.1 System Configuration

Briefly describe and depict graphically the equipment, communications, and networks used by the system. Include the type of computer input and output devices.

You need to assemble some parts of the system before use it. Here are pictures of the steps that show you how to mount the system.

- (1) Put the head of the mannequin in the torso



(2) Support the head in the torso with the lock.



(3) Connect the cable of the head in the port of the torso.



(4) Turn around the mannequin and connect the cable of the blue box in the blue port.



(5) Connect the green cable of the head to the green port.



(6) Connect the blue box to a switch.

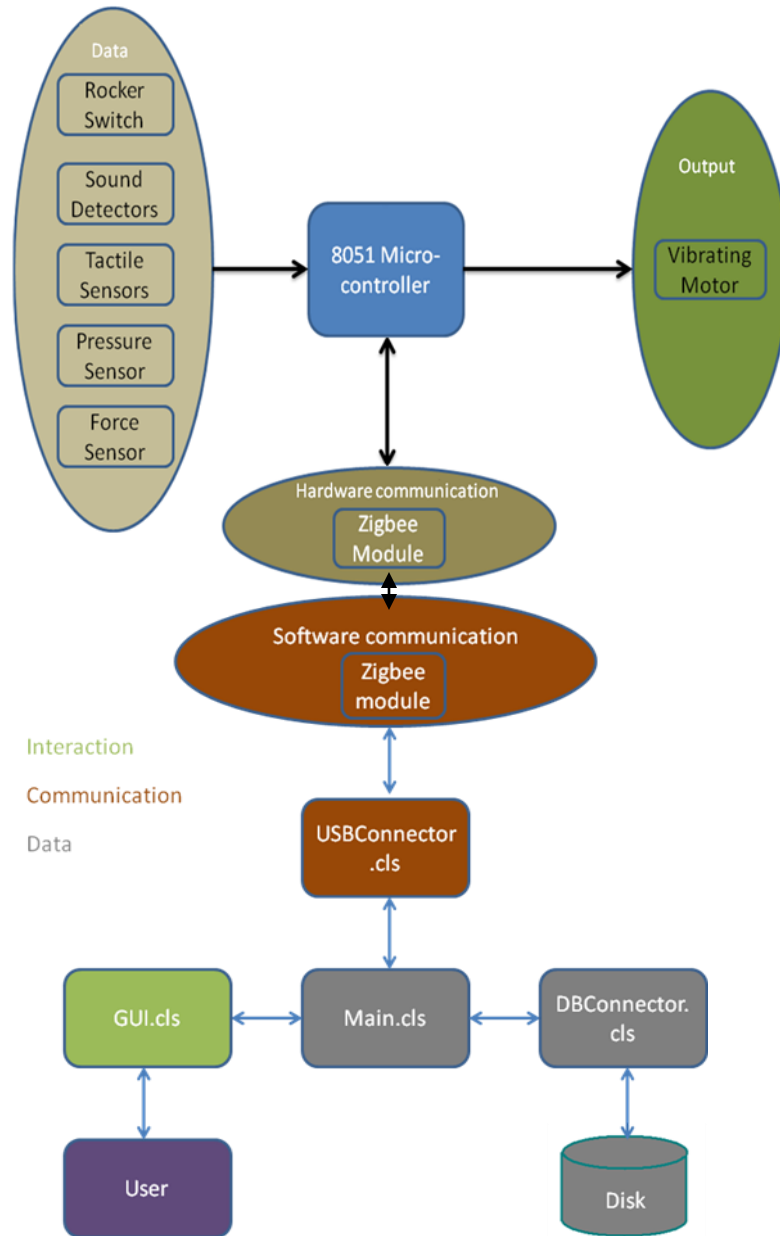


(7) Turn on the blue box.



2.2 Data Flows

The system can be divided into two main modules, hardware and software. The hardware module has a one-way communication from the sensor and devices to the micro-controller. At the software module exists two way communications between the Graphical User Interfaces class, the Main class, user and the database. The communication in the software module indicates the interaction between the user and the application. The user could be inputting student information on the system, and when the user is done, the system will provide a feedback form to the user, indicating the status of the request of the user. There is a two-way communication between both modules. This design was implemented for the hardware module to send information about the sensors to the application, while the application indicates the micro-controller when a training session is started and when a training session ended.



2.3 User Access Levels

The system currently allows two types of users: unlogged and logged users. The unlogged user have access to the “How to”, “Training”, and “Settings” of the application, while the logged user has access to those and is able to add/delete student, course, and section information and to store training session results.

2.4 Contingencies and Alternate Modes of Operation

The system has been developed to detect and correct some errors. At the hardware module, if a connection is disconnected at the sensors, the status Light Emitting Diode (green) on the bottom of the mannequin will turn off. If there is a problem with the micro-controller power, the Light Emitting Diode (red) at the box. At the software module, we are utilizing “try-catch statements” which ensure the continuity of the application. If an instruction fails, the statements shows a window indicating an error message that will allow the developers to find and correct the error displayed.

3.0 GETTING STARTED

3.0 GETTING STARTED

This section provides a general flow walkthrough of the system from initiation through the exit.

3.1 Logging On

To logging on the system you must double click the CPreTAM application. When you are in the principal frame, click file and then *log on* into the system.



3.2 System Menu

This section describes the system menu first encountered by the user, as well as the navigation paths to functions noted on the screen.

3.2.1 View my account info

Log on → File → Account → View my account info

AccountInfo

Full name:

Username:

New Password:

Confirm password:

Secret question:

Answer:

3.2.2 Create a course

Log on → File → Account → Create a course

CPR e-TAM

File Edit Help

Tutorials: Interactive steps for effectively using this program.

train your students.

Settings: Configure this program to your liking.

[More Info](#)

Logged on: Yes

Exit

Add course

Course code:

Course number:

Course section:

Section capacity:

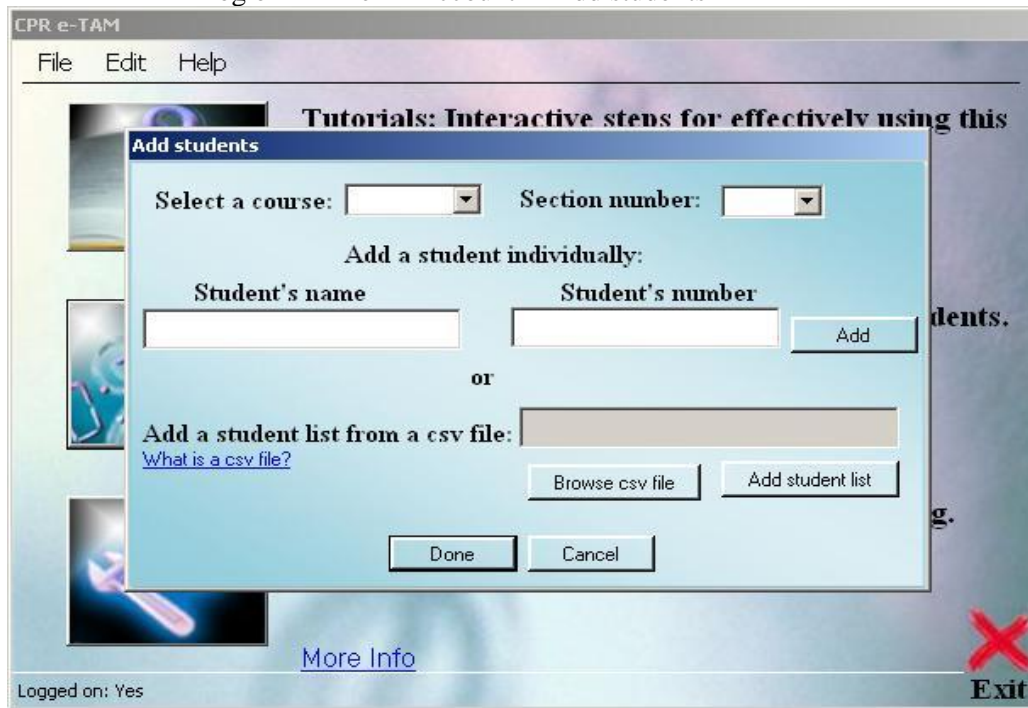
3.2.3 Add a section to a course

Log on → File → Account → Add a section to a course



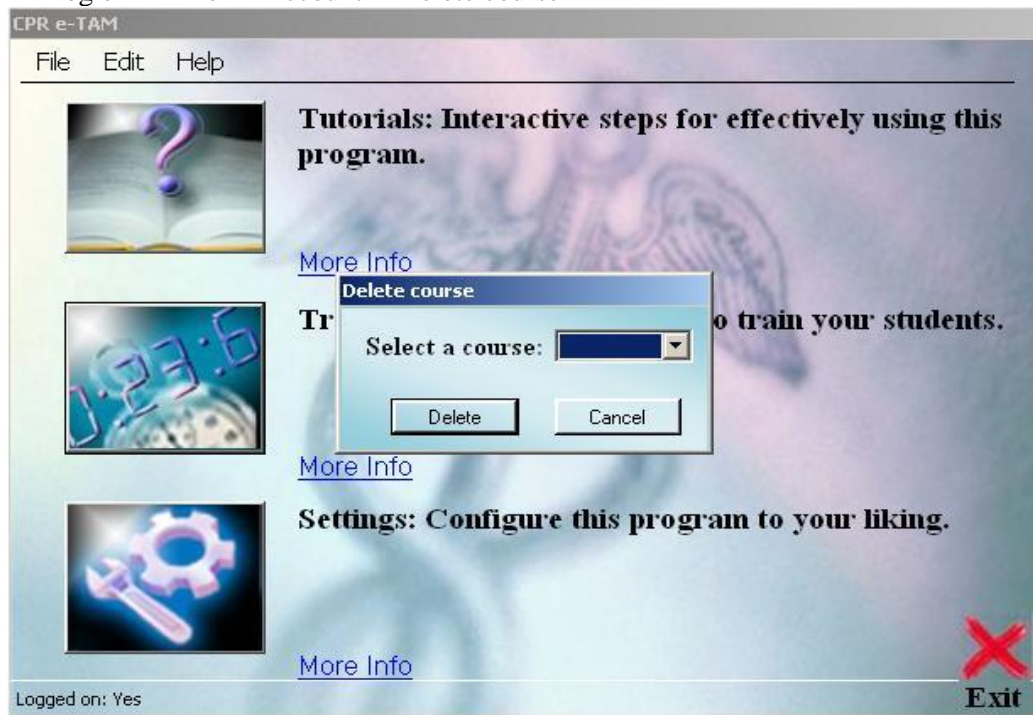
3.2.4 Add students

Log on → File → Account → Add students



3.2.5 Delete course

Log on → File → Account → Delete course



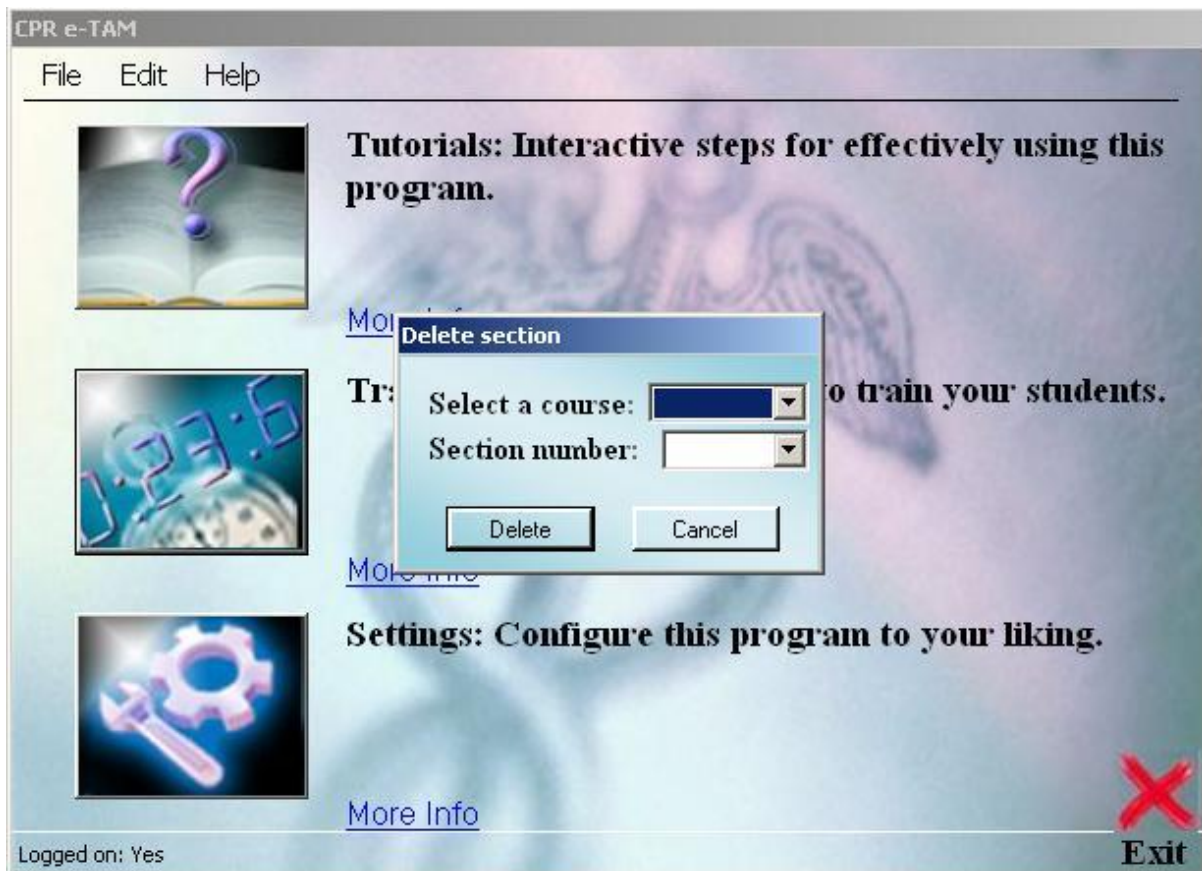
3.2.6 Delete students

Log on → File → Account → Delete students



3.2.7 Delete sections

Log on → File → Account → Delete sections



3.2.8 Test USB data transfer

Log on → Back button → Edit → Test USB



3.2.9 Tutorials

Select Tutorial Icon (First icon at main screen).

The screenshot shows a 'How-To' menu with a blue header. It contains three tutorial entries, each with an icon, a title, and a 'More Info' link. A 'Back' button is located at the bottom left.

- Perform CPR: The steps necessary to successfully performing the CPR procedure**
[More Info](#)
- Add course/students: Learn how to add a course and students into the system**
[Less Info](#)
- View past results: Create a report to follow student progress**
[More Info](#)

[Back](#)

3.2.9.1 How to Perform CPR

Tutorial→Perform CPR (first icon at tutorial screen)

How to perform CPR

Welcome to the tutorial for performing CPR.

DISCLAIMER: Before we get started, please keep in mind that this tutorial does not intend to replace formal CPR training. **Completing this tutorial does not mean that you are certified to perform this procedure**, but will help in obtaining a certification. In the probable case that you are a CPR instructor, the purpose of this tutorial is to see how the program will determine whether or not a student is performing the steps correctly.


Images courtesy of the Association of First Aiders (AoFA). For more information please visit www.AoFA.org

To continue on to the next part of the tutorial, click Next. If you need to go back for some reason, click Back. If at any time you wish to quit the tutorial and return to the main page, click Quit. Now that we have that out of the way, let's begin!

[What is interactive mode?](#)

Quit Previous Next

Interactive mode: Off

The logo for the Association of First Aiders (AoFA) is displayed on the right side of the tutorial screen. It features a green background with a white silhouette of a person's head and shoulders. Below the silhouette, the letters "AoFA" are written in a bold, white, sans-serif font with a slight shadow effect.

How to perform CPR

Welcome to the tutorial for performing CPR.


DISCLAIMER: Before we get started, please keep in mind that this tutorial does not intend to replace formal CPR training. **Completing this tutorial does not mean that you are certified to perform this procedure**, but will help in obtaining a certification. In the probable case that you are a CPR instructor, the purpose of this tutorial is to see how the program will determine whether or not a student is performing the steps correctly.

Images courtesy of the Association of First Aiders (AoFA). For more information please visit www.AoFA.org

To continue on to the next part of the tutorial you need to go back for some reason, click Back. At any time you wish to quit the tutorial and return to the main menu, click Quit. Now that we have that out of the way, let's get started.

[What is interactive mode?](#)

Interactive mode: Off



HowTo Would you like to enable the interactive version?

3.2.9.2 How to Add Courses

Tutorial→Add Courses/Students (second icon at tutorial screen).

The screenshot displays the 'frmHowTo_AddCourses' window. On the left, a tutorial titled 'Tutorial for adding courses & students' provides instructions. The main area shows the 'CPR e-TAM' application interface with the 'File' menu open and 'Log in' highlighted. Below this, a 'Log on' dialog box is shown with the username 'mendoza' and a masked password. Navigation buttons 'Quit', 'Previous', and 'Next' are at the bottom left.

frmHowTo_AddCourses

Tutorial for adding courses & students

The first step in adding a course and students is to log into your account. Of course if you don't have an account you will need to create one. The steps for creating an account are fairly straightforward, and therefore not covered in this tutorial.

To log in, simply click the **File** menu strip item, and select **Log in**. A new window will pop up, asking for your username and password. Enter them into the appropriate field, and select **Ok**. If you entered the information correctly, the program goes back to the main window, and the status strip should read "**Logged on: Yes**".

[Quit](#) [Previous](#) [Next](#)

CPR e-TAM

File Edit Help

Log in

Account

Save...

Open...

Quit

Tutorials: Interactive program.

[More Info](#)

Training: The to

Log on

Username: mendoza

Password: ●●●●

[Create a new account](#)

[Forgot your password?](#)


Ok Cancel

Settings: Configure this program t

3.2.9.3 View past results tutorial.

Tutorial → View Past Results (third icon at tutorial screen).

Begin Training



View/edit courses: Easily organize student, courses, and sections (Requires authentication)

[More Info](#)

Create a detailed report

Course	Section
EDFI 3645	100

Back Generate report

training results in
en located. To use
n the Advanced
ata cable.)

ast session results

(Requires authentication)

[More Info](#)

Log out Back

Exit

Logged on: Yes

3.2.10 Training

If you are logon you can see the information described below.

3.2.10.1 View/edit course

Training → View/Edit courses (One icon at training screen).

The screenshot displays a web interface for managing student information and courses. It is divided into two main panels: 'Student information' on the left and 'View/Edit Courses' on the right.

Student information panel:

- Student name:** Text input field containing 'Elaine Benes'.
- Student number:** Text input field containing '123-45-67890'.
- Average grade:** Text input field containing '0'.
- Course Name:** Text input field containing 'EDFI'.
- Section:** Text input field containing '100'.
- Course Number:** Text input field containing '3645'.
- Buttons: 'Apply', 'Cancel', and 'Delete'.
- Link: [How do I edit or delete a student?](#)

View/Edit Courses panel:

- Courses:** List box containing 'EDFI 3645' and 'EDFI 8995'.
- Sections:** List box containing '100'.
- Buttons: 'Back'.
- Links: [Create course](#) and [Create section](#).

Students panel:

- List box containing: Juanma Feliciano, Magic Johnson, Frank Sinatra, Jerry Seinfeld, George Costanza, Elaine Benes (highlighted), and Cosmo Kramer.
- Button: **Detailed Information**.

3.2.10.2 Begin a training session

Training → Begin a training session (second icon at training screen).

Live Training - Instructor: frank mendoza

Grading
 Enabled Disabled

Grading Profile
 Default
 Custom

CPR Cycles
 1
 2
 3

Course: EDFI 3645 Section: 100
Student: Juanma Feliciano

Session Information

Elapsed time: 00:00:00 (hh:mm:ss)

Live Preview
 Enabled Disabled

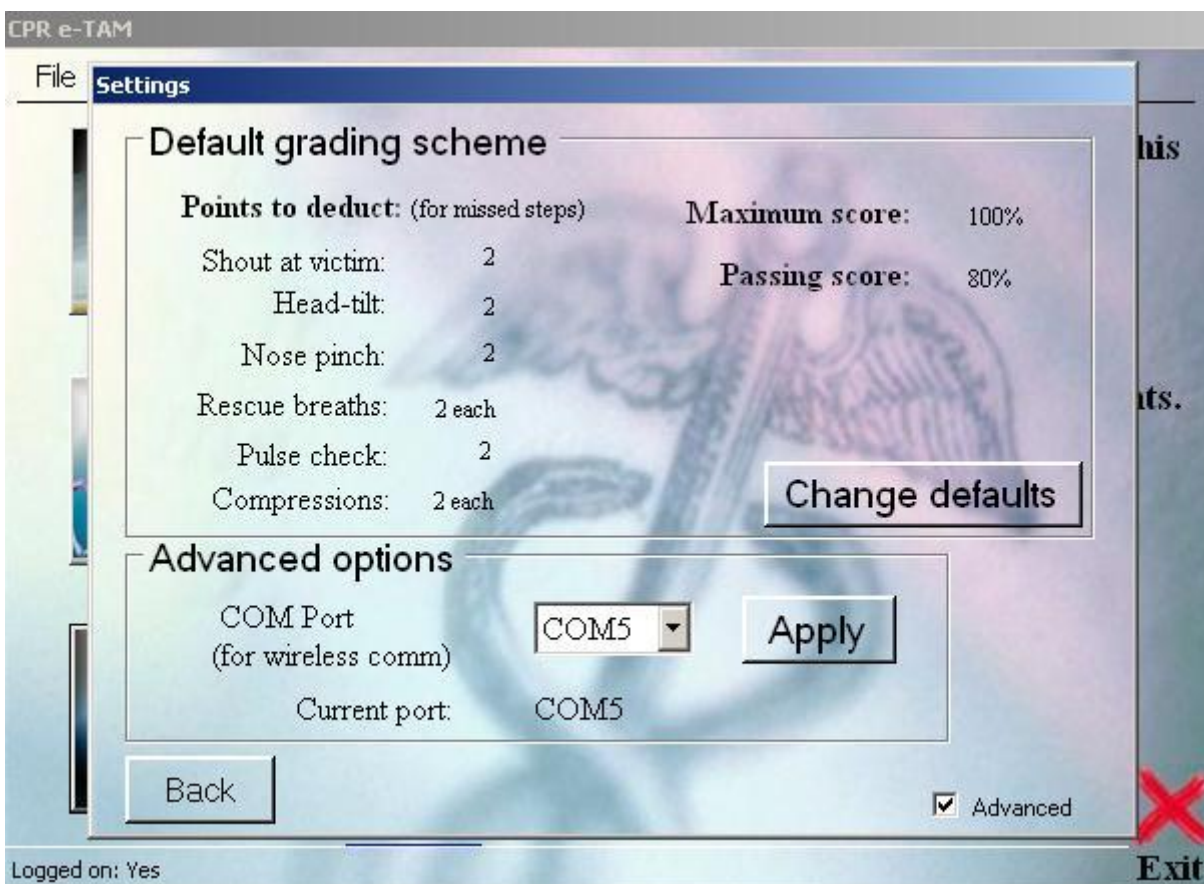
Save results?
 Yes No

START

Back Prev. Step STOP

3.2.11 Settings

Select Settings (Third icon at main screen).



3.3 Changing Password

To change the password you must press the logon button and click the *Forgot your password?* option and enter your username. In the next frame you must answer your secret question, enter a new password, and confirm it. Now your password is change.

3.4 Exit System

To exit the system you must find out the way to see the exit red X pressing back or quit button. It depends on the frame you are.

4.0 REPORTING

4.0 REPORTING

4.1 Report Capabilities

The application is able to create a report of the session realized by a student. The report starts with a table that shows the last 5 grades of the student within a section of a course. That table also shows the average grade of the student. If you select a student, by clicking over his/her name, you can see the passing grade expected by the evaluator, the grade obtained by the student and where the student failed.

Table summary:



Evaluation report for

EDFI 3645 - 070



Below is the evaluation summary for the specified section. To view a detailed report of a particular student, click his or her name.

Student name	Student number	Session grades					
		Avg	1	2	3	4	5
Juanma Feliciano	802-03-1061	N/A	N/A	N/A	N/A	N/A	N/A
Magic Johnson	555-55-5555	N/A	N/A	N/A	N/A	N/A	N/A
Frank Sinatra	569-22-3265	N/A	N/A	N/A	N/A	N/A	N/A
Jerry Seinfeld	456-03-4568	79	100	96	100	20	N/A
George Costanza	456-40-5879	N/A	N/A	N/A	N/A	N/A	N/A
Elaine Benes	123-45-6789	N/A	N/A	N/A	N/A	N/A	N/A
Cosmo Kramer	987-65-4321	N/A	N/A	N/A	N/A	N/A	N/A

Click on a student's name to jump to his or her detailed report.

Juanma Feliciano [Back to top](#)

No procedures performed yet!

Results:

Session number 2
 Grade 32/100
 Passing grade for this session 80/100

First cycle

Consciousness check	<input checked="" type="checkbox"/>
Head-tilt, chin-lift	<input type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input type="checkbox"/>
Pulse check	<input type="checkbox"/>
Chest compressions	<input type="checkbox"/>
Head-tilt, chin-lift	<input type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input type="checkbox"/>

Second cycle

Head-tilt, chin-lift	<input type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input type="checkbox"/>
Chest compressions	<input type="checkbox"/>
Head-tilt, chin-lift	<input checked="" type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input checked="" type="checkbox"/>

Third cycle

Head-tilt, chin-lift	<input type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input type="checkbox"/>
Chest compressions	<input type="checkbox"/>
Head-tilt, chin-lift	<input checked="" type="checkbox"/>
Nose pinch	<input type="checkbox"/>
First rescue breath	<input checked="" type="checkbox"/>
Second rescue breath	<input checked="" type="checkbox"/>