

Technical report

29 of March 2019

Kayak Surf Euskadi App



Client:

**Euskadi Kayak Surfing Federation Biscay
Canoeing Federation**

Product developer:

Maristak Ikastetxea Durango

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INTRODUCTION

This document contains the Technical Report of the Kayak Surf Euskadi project that has been carried out by Maristak Ikastetxea Durango for the Kayak SURf Federation of the Basque Country and the Biscayan Canoe Federation.

The project has been carried out through the TKGUNE programme, an initiative launched by the Vice-Ministry of Vocational Training in the 2014/15 academic year. In this initiative, the public and subsidised centres that participate have the objective of facilitating the two-way transfer of knowledge between VET centres and companies.

This document will describe the specifications and technical characteristics of the project, focusing on its main axes: the software and hardware that have been developed.

OBJECTIVE

The aim of the project is to use new technologies and develop a product for the Kayak Surf competitions of the Basque Country federation to replace the current one. Its main function is to act as a timer for the different phases of the competition (green, yellow and red) and to emit a signal to activate the horn to alert the competitors of which phase they are in.

In order to achieve this objective, a mobile application has been developed, as well as the necessary electronics to act on the horns automatically.

MOBILE APPLICATION

This section details the technical characteristics of the mobile application and the platform on which it has been developed.

Technical characteristics

The technical characteristics of the devices for which the APP has been developed are detailed in this section.

- Target Operating System
 - Android 6.0 onwards.
- Devices on which the application has been tested:

Device	Type	SO	Features
Huawei Honor 9	Smart Phone	Android +7.0 EMUI 5.1	Huawei Kirin Octa-Core960, RAM: GB6 Internal Storage: GB 64Bluetooth BT4.2 (+info)
Huawei MediaPad T5	Tablet	Android +8.0 EMUI 8.0	HUAWEI Kirin Octa-Core659 A53 RAM: GB3 Internal storage: 32 GB Bluetooth®: BT compatible 4.2,with BT 3.0 and BT 2.1+EDR (+info)

*Huawei MediaPad T5 Tablet is included with the project delivery.

How the application works

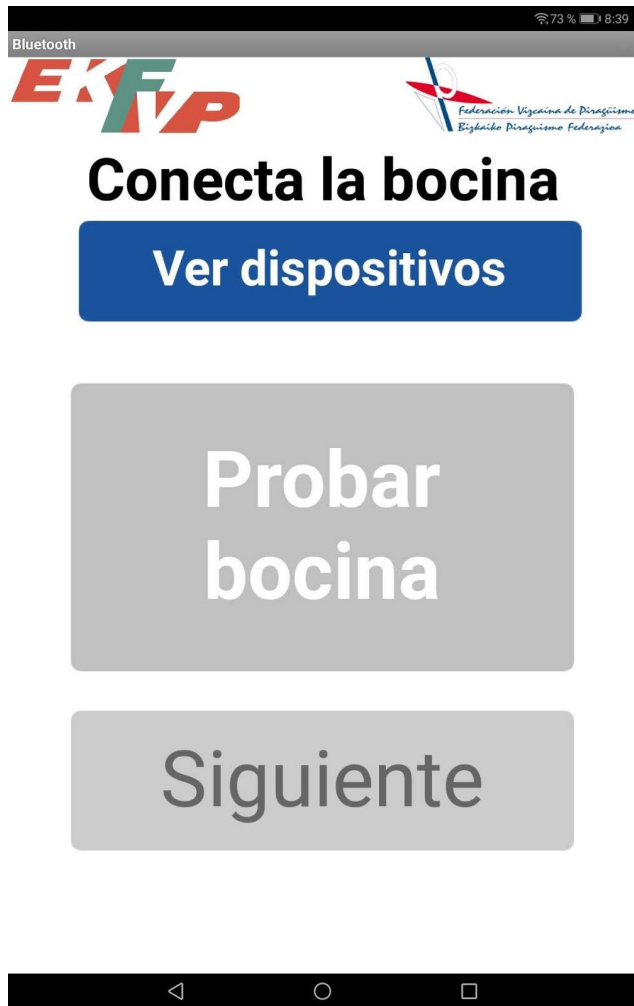
Below are the different screens that show how the application works: Before starting to use the APP, the following must be taken into account:

- The device associated with the electrical box is the **HC-06**.
- Due to the way the APP works, it is necessary to pair with the HC-06 before starting the application for the first time. To do this, from Android, activate Bluetooth, select **HC-06** and pair it. The password is **1234**.

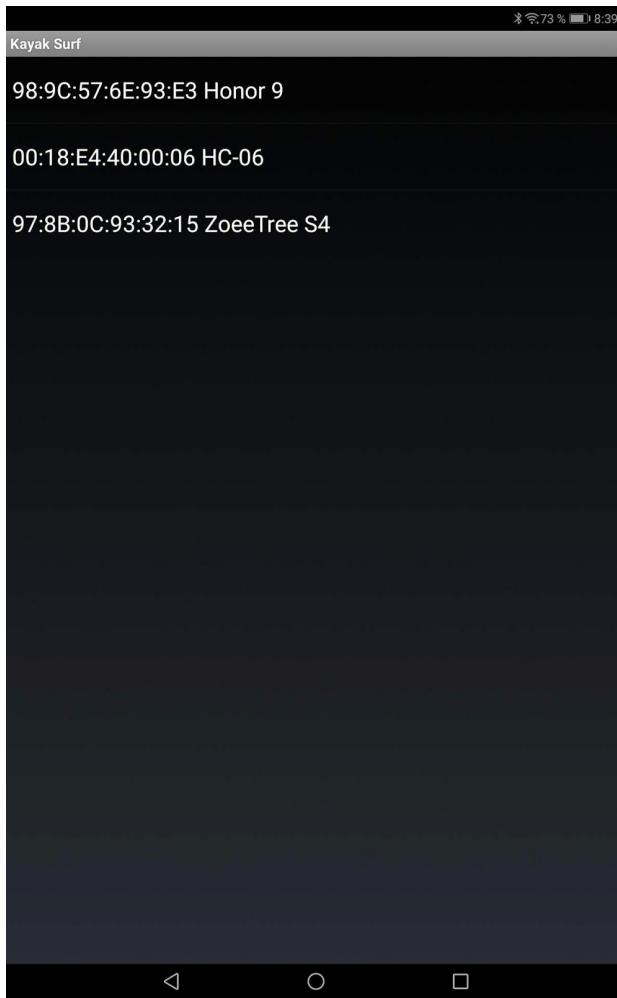
1. Presentation screen



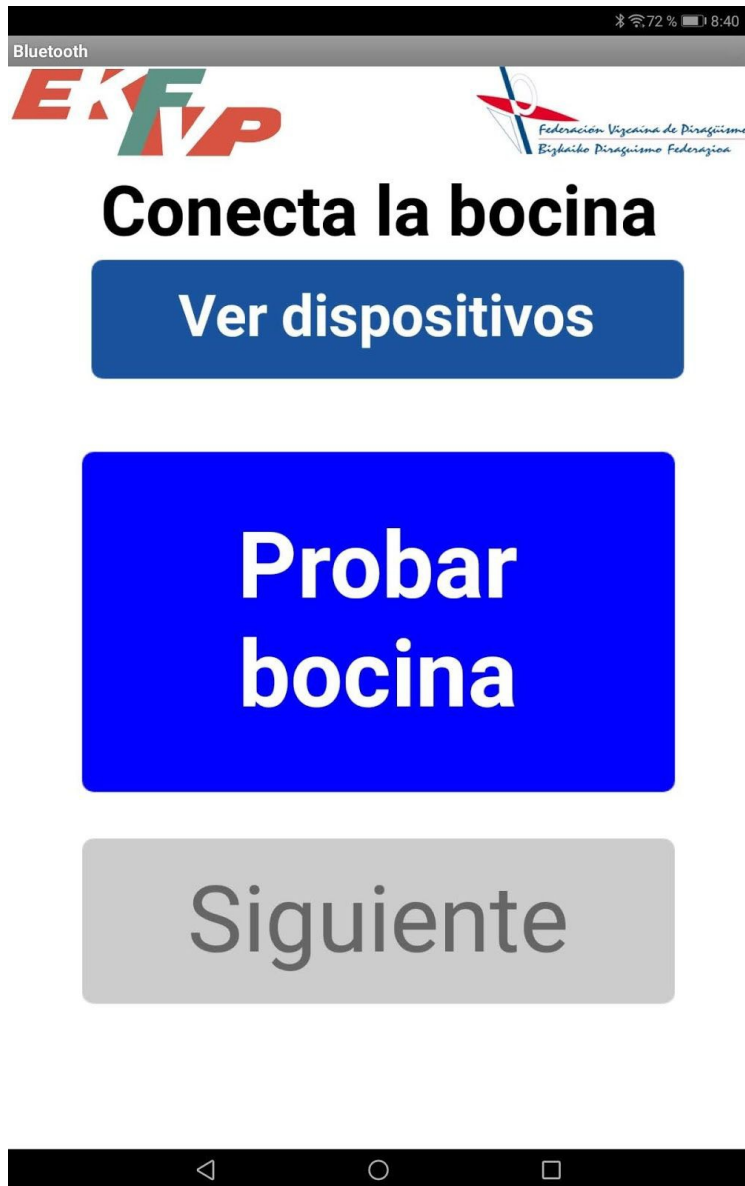
2. Speaker test screen: Click on "View Devices" to select the speaker.



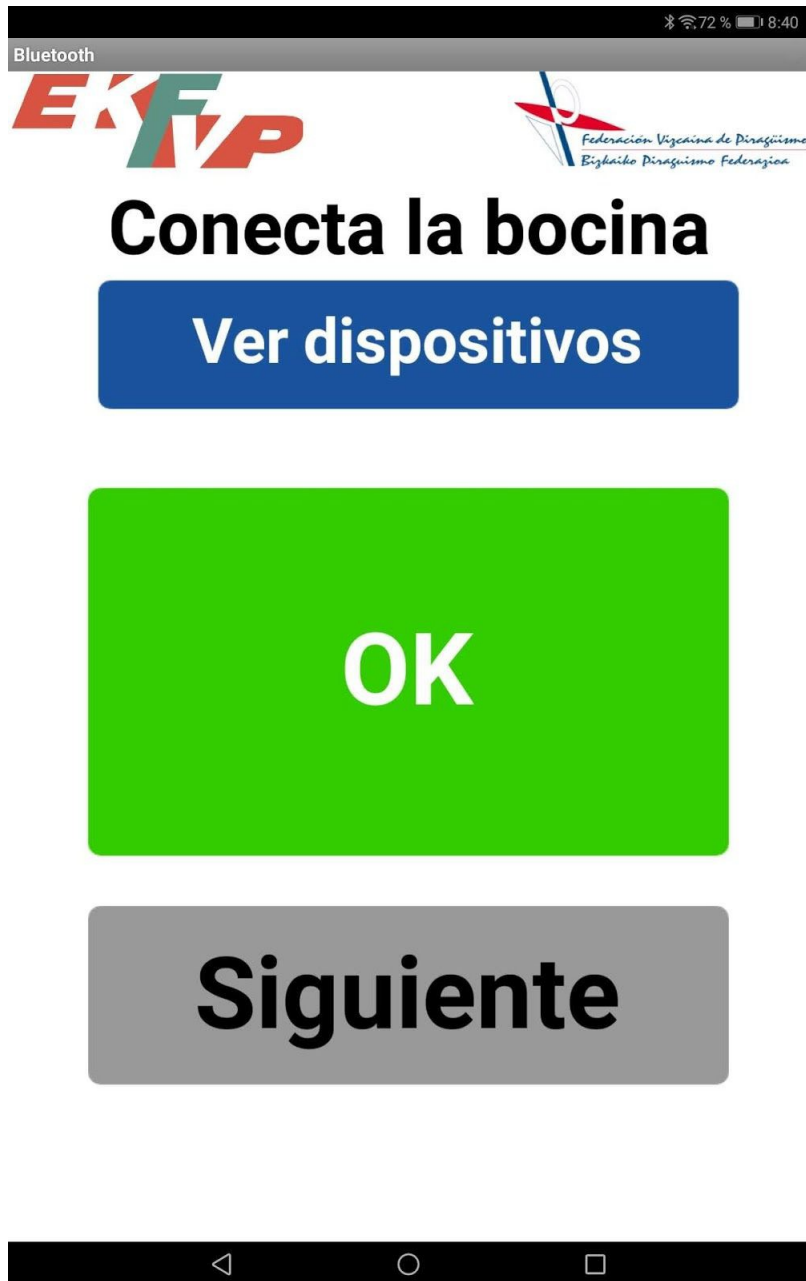
3. Bluetooth device selection: Option HC-06 is selected.



4. Once the "Test horn" button is activated, the horn can be tested for sounding.



5. When we are shown the OK button we can move on by clicking on "Next".



6. Screen with a summary of the sections. If we click on the "Stopwatch" icon we can configure it. The values shown at the start are the default values for all competitions.



7. Configuration screen



- Summary screen. In this example we have specified seconds10 for each section to test the APP in an agile way.



9. Main Leg Display. Emits a horn signal at the start.



10. Final Leg Display. Emits two horn signals at the start.



11. Water Exit Display. Emits three horn signals at the start. Once completed, it returns to the initial (green) section.



Software development platform

The development platform used to programme the APP is MIT App Inventor. It2. has been selected for the following reasons:

- Advanced programming skills are not required, so maintenance is easier.
- The applications generated through this platform are efficient on the target devices.
- There is no need to install an IDE or development environment on the programmer's machine, as all actions are performed through a web browser.

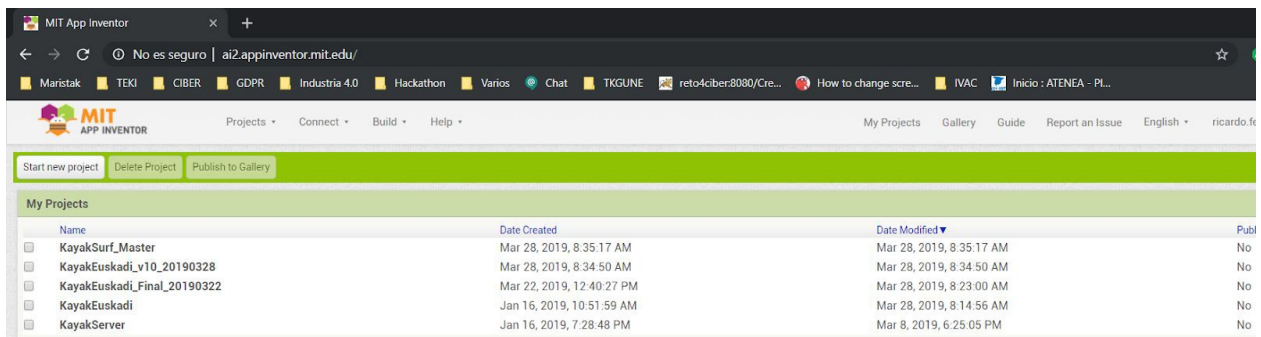
Requirements for using the platform

To use the MIT APP Inventor platform, 2, hereafter AI2, it is necessary to create an account on the same platform, or use the google account to connect directly.

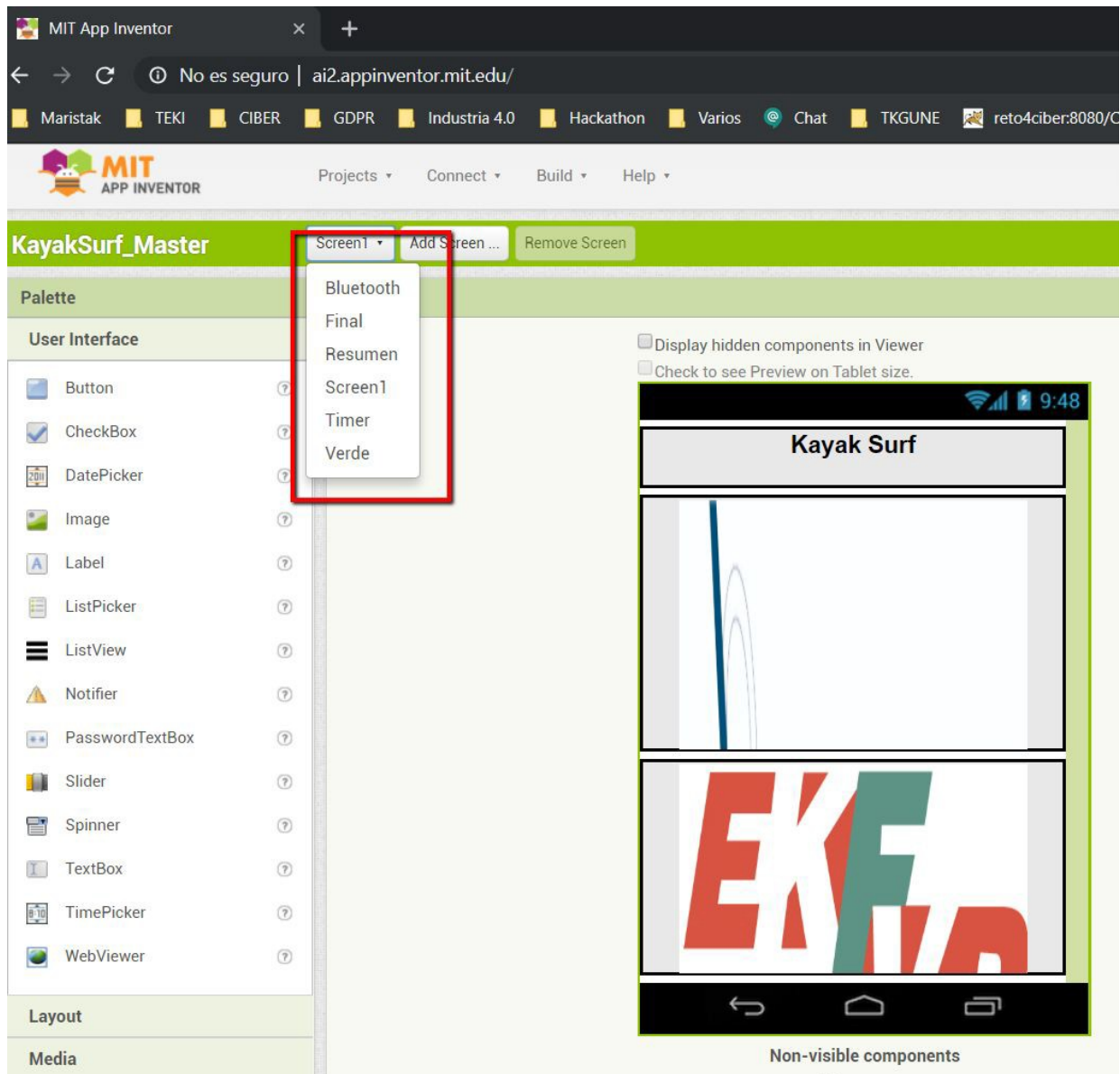
In terms of technical requirements, a PC with a web browser, preferably Google Chrome, is sufficient.

Projects

In this screen you can see the projects that each user has in AI2:

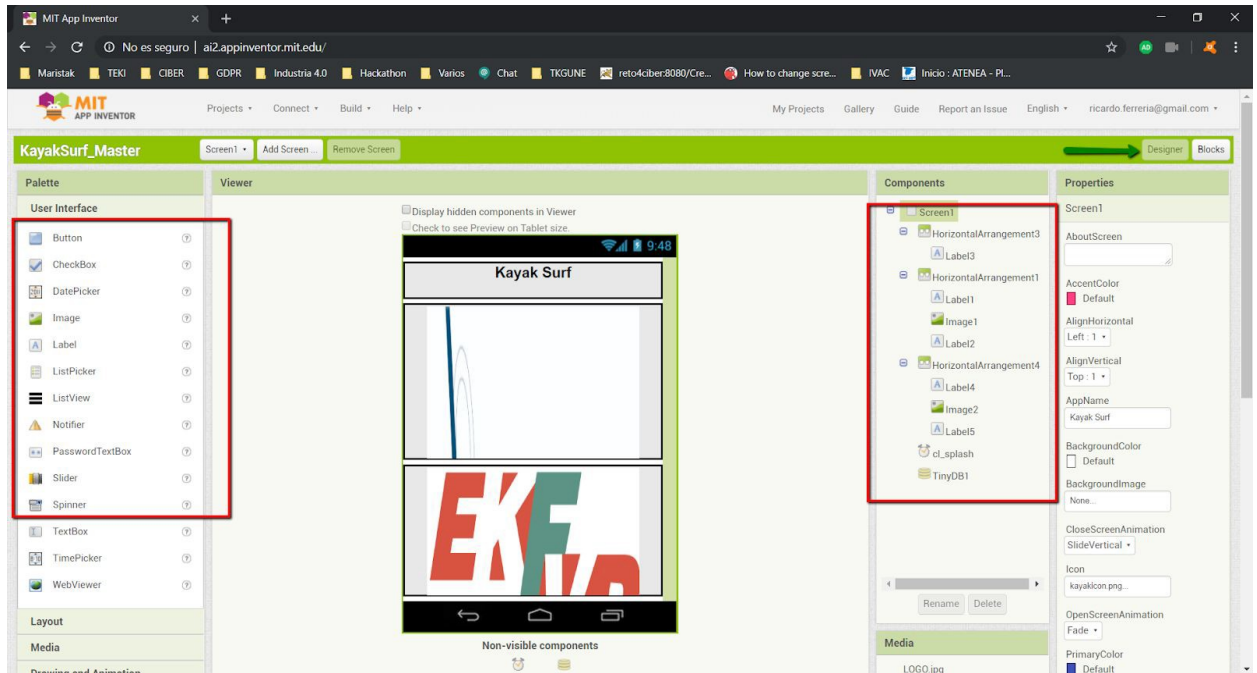


If we enter a project, we will see all the screens we have:

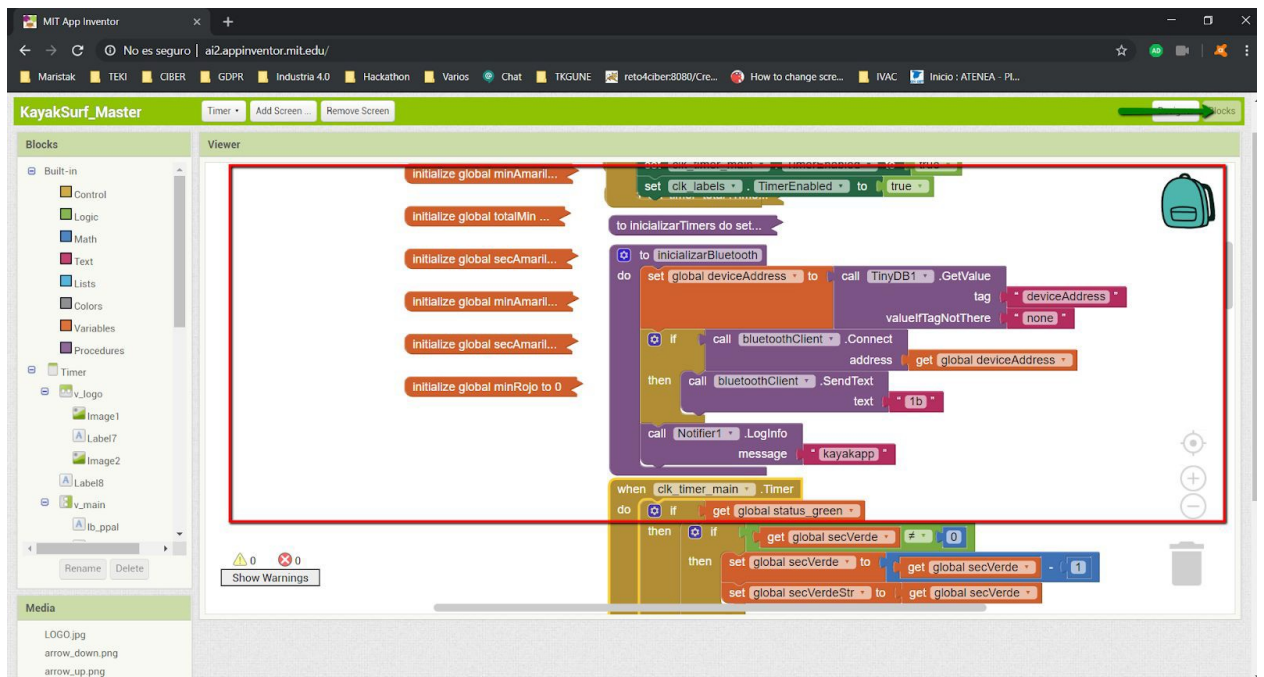


The screens have two sections: a **design** section and a **block programming** section.

1. Design Screen



2. Block Programming Screen



3. Importing the project

If we want to import the source code of the Kayak Surf Mobile App, which has been delivered with this documentation, just select the option **"Import Project .aia from computer"** and **"Import KeyStore"**. The files to import are the following:

Nombre	Fecha de modifica...	Tipo
 android.keystore	28/03/2019 8:35	Archivo KEYSTORE
 KayakSurf_v10_20190328.aia	28/03/2019 8:35	Archivo AIA

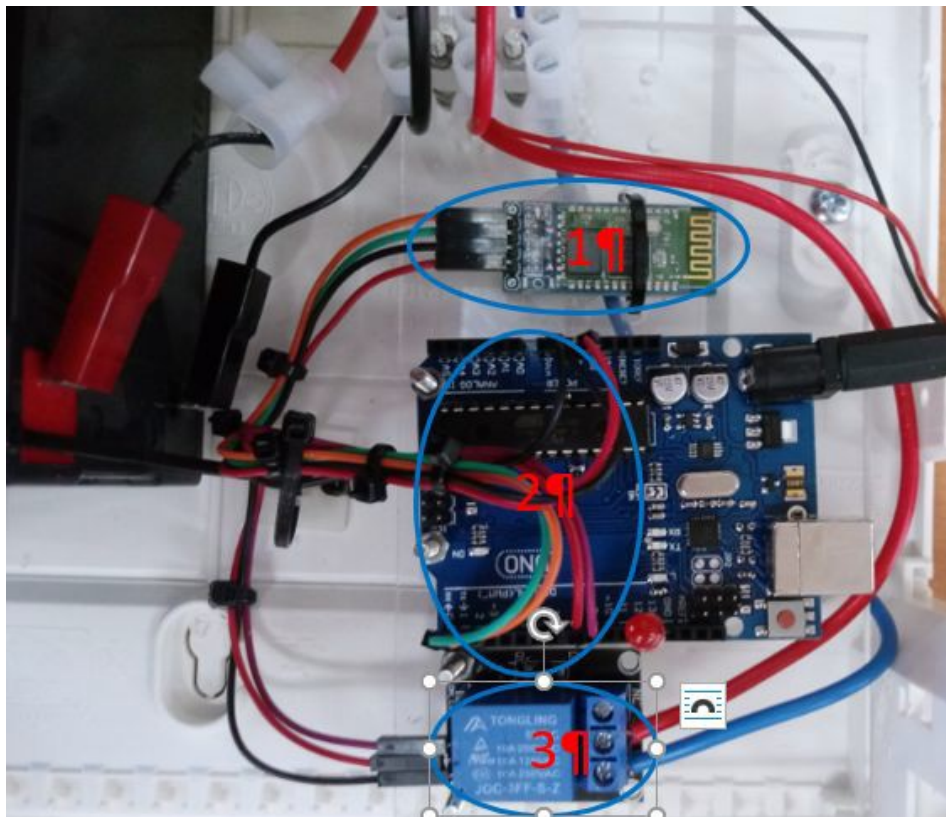
ARDUINO UNO ELECTRONIC BOARD

The main features of the Arduino Uno board are detailed below.

Technical characteristics

- Input Voltage (Recommended): 7 - 12 v
- Digital Inputs/Outputs Pins: (14Of which PWM 6outputs)
- Analogue Input Pins: 6.
- Flash memory: KB32 (ATmega328) of which KB0,5 is used by Bootloader.

Circuit diagram



Bluetooth connections:

- Orange Tx.
- Green Rx.
- Red V5.
- Black GND.

Arduino Uno connections:

- Orange Rx.
- Green Tx.
- Red (photo below) pin 8.
- Violet pin 9.
- Red (photo above) 5V.
- Black GND.

Relay 5V DC

- Black -.
- Red1 +.
- Violeta S.
- Red2 com
- Blue

NO Relevant

12V DC

- White - (Black wires terminal).
- Red + (Red wires terminal).
- Yellow compressor +
- Blue 5Vdc relay

NO. Compressor

- Black -.
- Yellow +

Software development

The programming of the Arduino UNo board has been done through the Arduino software.



To load the programme, the following steps shall be carried out:

1. Open the file from the Arduino environment.
2. Connect the Arduino board through the USB port.
3. Compile the programme.
4. Upload the programme.

PROJECT DELIVERY

The following is the information relating to the delivery and closure of the project

Warranty and testing phase

As of 29/03/2019, the product has been delivered to the Biscay Kayak Surf Federation, with the aim of testing it and obtaining its validation. Maristak Ikastetxea Durango will offer a one-month guarantee, which ends on 10/05/2019 (extended until this date due to a two-week holiday period), to solve problems related to the correct functioning of the application.

This warranty does not cover modifications to the current design, addition of new functionalities, or changes to the screen flow. Similarly, for the electronics part, the warranty covers only malfunctions.

The project is now closed.





Account credentials

Below are the credentials of the accounts used for the development of the project, which can be modified by the client at any time.



- Google Account
 - Mail: **kayaksurfeuskadi@gmail.com**
 - Password: **kayak999\$**
- PIN Tablet: 1452
- Bluetooth PIN: 1234

Source Code

With this project the source code of the product is delivered: on the one hand it includes the sources of the mobile app, and on the other hand the sources of the programmable automaton. The source code of both can be located in the directory structure as delivered.

Nombre	Fecha de modifica...	Tipo	Tamaño
 00-Prototipo	08/01/2019 17:25	Carpeta de archivos	
 01-Código fuente	22/03/2019 12:58	Carpeta de archivos	
 02-Recursos	28/03/2019 8:51	Carpeta de archivos	
 03-Memoria Técnica	22/03/2019 12:46	Carpeta de archivos	

In the directory "01-Source code" you will find the mentioned sources:

Nombre	Fecha de modifica...	Tipo
 00-APP Android	28/03/2019 8:37	Carpeta de archivos
 01-Arduino	22/03/2019 12:46	Carpeta de archivos

Hardware Resources

As part of the project, the following HARDware resources are delivered and included in the project cost:

- Huawei MediaPad T5 Tablet.
- Arduino Uno board and relay 5V dc and 12Vdc
- Horn
- Battery 12V dc 7Ah

The electrical box is also a product, but its costs have not been taken into account.

Recommendations in case of blockage

In case the application is blocked for any reason, the following is recommended:

- Close the application and disconnect Bluetooth.
- Switch off the electrical box and switch it on again with the ON/OFF button.
- Start the application.
- Activate Bluetooth and pair it with the electrical box (HC-06).