

## Intermediate Control Points

### Using barcodes, QR or NFC instead of Sportident

#### Intro

Use case: use some alternative system to the Sportident card to send data of intermediate readings of the participants in an event. For example, a "walk" type event with a number of participants potentially greater than the number of Sportident cards available.

Android devices allow easy integration of content reading from other types of mechanisms such as barcodes, QR codes or NFC cards.

#### Important notice

This is not a product. It's just the result of a benchwork where the author implements and tests ideas and solutions related to the sport of orienteering and IT. So, there are no fancy designs, complete reference guides or user's support.

Before going on, it would be interesting to familiarize yourself with the original follow up and integration system with OE2010 because the introductory document explains the use of the app and the web client.

[http://www.jaruori.es/cpiminimo/intro\\_en.pdf](http://www.jaruori.es/cpiminimo/intro_en.pdf)

#### User's Web Side

To manage an event it is necessary to create and configure it from a website. The web pages of the user part are at the following address:

<http://www.jaruori.es/minintro.jsp>

#### User's Smartphone Side

Only Android devices. Using NFC tags requires NFC capability. At least, Android 8.0, Oreo, is required. During the first execution, permissions must also be granted to obtain photos, in order to read barcodes or QR.

The smartphone runs the application, which can be downloaded from the following address:

<http://www.jaruori.es/cpiminimo/SiPunchTxUsb3.apk>

**IMPORTANT.** This version of the application includes all the previous functionalities for setting radio controls and downloading/sending the complete content of Sportident cards.

## Options for sending punches

Smartphone app,

The Smartphone application, in addition to connecting to Sportident stations, can send manual readings. 3 basic data are needed: SiCard number, passing time and station code.

The passing time can be left empty and then the current time of the device will be taken.

The station code only needs to be written the first time when the user is placed in the corresponding place. It can be a number  $\geq 31$  or you can put some special numbers: 0=checking station; 1=start station; 2=finish station

**IMPORTANT.** When using this application integrated with the OE program for event management, keep in mind that in the radio controls section, OE considers as finish any reading that comes with a station code less than 31. Therefore, if you are planning using OE integration, the special check and start stations should not be used

The SiCard number is the value that links a participant in the management of radio controls integrated with OE. There are other types of events that do not require OE integration, such as the Rogaines tracking solution. In this case, the data of participants, categories, clubs, etc. are managed from the web and then the participants can be identified by SiCard or by Bib number.

## Barcode, QR or NFC data format

Barcodes and QR codes are images and reading occurs by taking a photo. There are several different formats but in general the Smartphone will be able to interpret them.

NFC cards use a wireless communication protocol. There are several formats. Only the types of cards that use the NDEF protocol are handled in the application. For example, NTAG213 or NTAG215

This solution contains a specific syntax for the values read from barcodes, QR codes or NFC cards. It is contemplated that a participant comes identified by Bib number or also by SiCard. In the case of using barcodes, QR or NFC instead of Sportident cards, the SiCard data would actually be somewhat fictitious, as it would be equivalent to the usual use with Sportident cards.

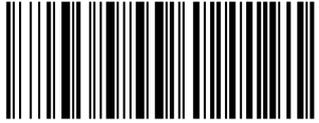
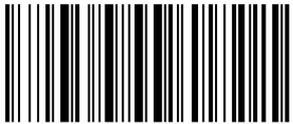
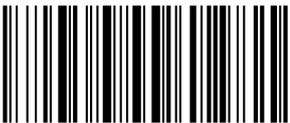
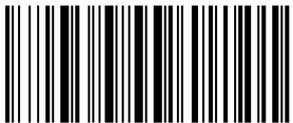
There are two different cases: when a participant is passing or when the user sets the type of station. When a user launches the app, he sets the code of the station in which he is going to locate himself. When participants begin to pass, readings are made.

Participant identification. A barcode, QR code should be generated or a text should be written in a NFC tag. The format is “bbb;ssssss” (without quotation marks, both values separated by a semicolon), being “bbb” the Bib number and “ssssss” SiCard number (fictitious)

Only Bib number could be used, but then the integrated use with OE would require uploading a file associating Bib numbers to SiCards on the CPI website for radio control management.

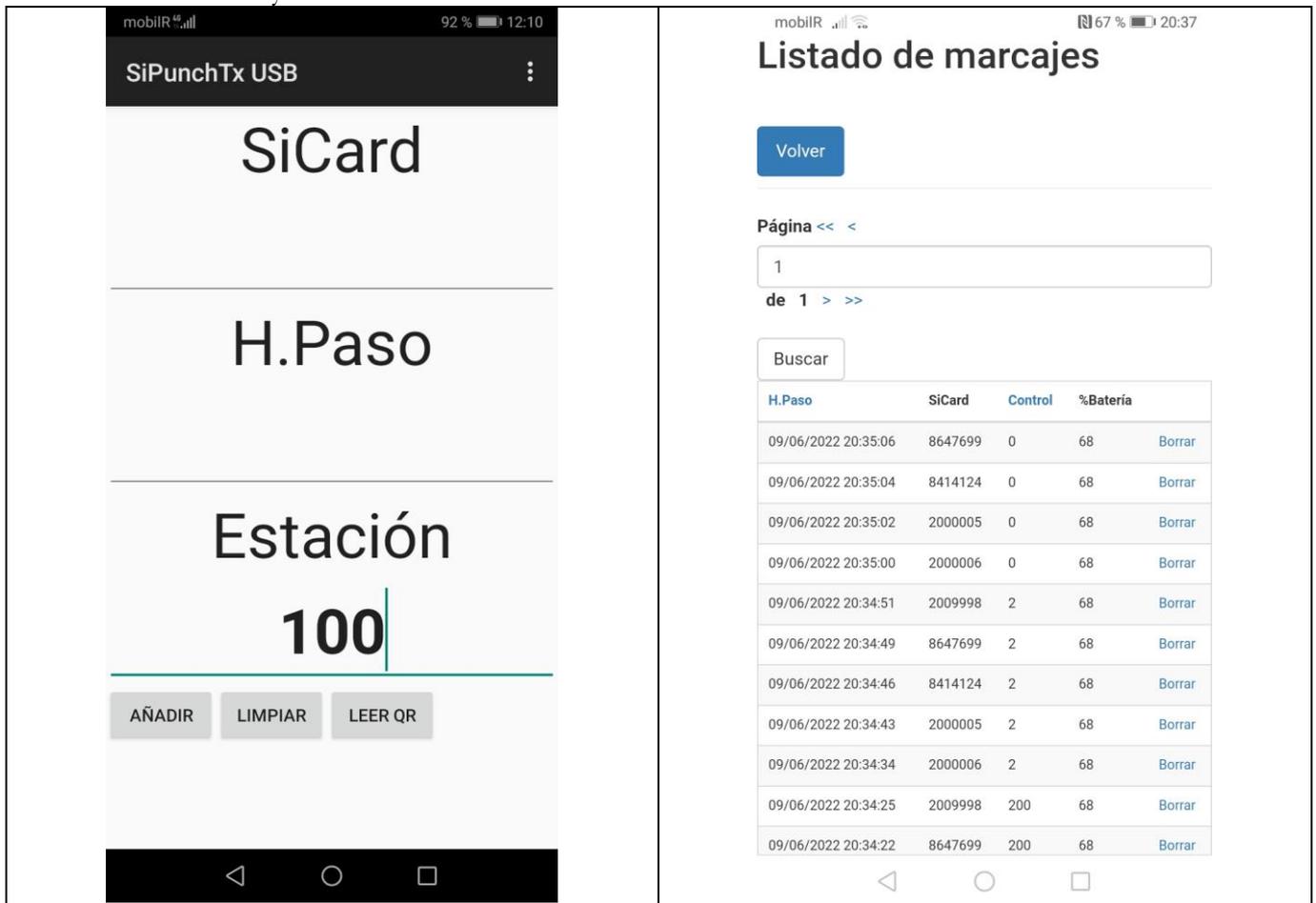
Station identification. The format for the value should be “Control:xxx” (without quotation marks, title and value separated by a colon). xxx can be a station number, for example 100, 35, etc. It can also be a single letter: C=Check; S=Start; F=Finish. The Smartphone app will translate letters to numbers: C=0; S=1; F=2

Below you can see several examples of cards and barcodes/QR. There are many free websites that allow you to generate codes and store the images. In this case, the CODE128 format has been used

 <p>101;2009998</p>	 <p>102;8647699</p>
 <p>104</p>	 <p>Control:31</p>
 <p>Control:100</p>	 <p>Control:C</p>
 <p>Control:S</p>	 <p>Control:F</p>
 <p>101;2009998</p>	 <p>102;8647699</p>
 <p>Control:100</p>	 <p>Control:S</p>
 <p>Control:F</p>	 <p>Control:C</p>

## Appendix. Screenshots

Main screen of the Smartphone application and screenshot of the list of readings as can be seen on the web of the radio control system



With NFC activated on the Smartphone, simply bring an NFC card close to the device (usually at the top) and the reading process will be activated. If it is the definition of a station, for example Control:100, the result will be that the received value will be written in the station field, but no reading will be sent.

In case of using bar codes or QR codes, the reading will take place by pressing the "READ QR" button. This will open the camera. The application will automatically recognize the presence of a barcode or QR and perform the reading.

In case of receiving the reading of a value corresponding to a Bib or SiCard (a value that has only one Bib or a value with a Bib + SiCard separated by semicolons), the reading will be carried out and the reading will be sent immediately to the server on the internet. After a second you will again be ready to perform the next reading. This is done to avoid having to perform keystrokes or write data between reading and reading, so that the process can be accelerated.

## Contact

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Please, feel free to contact me before creating a new event, just to know about the interest to use the system.

Thank you.