Interface language: en / it / es

Prepare the file for milling

View in: English ⏶⏷ - Submitted by Federico_Vanzati on Mon, 19/12/2011 - 11:44

Introduction / Objectives:

Learn how to create a file that can be read by the iModela controller for milling a circuit

Part list:

- Fritzing
- Inkscape

Instructions:

in theory, any vector file can be used to control the cutter. If you want, then you could draw the file using Illustrator or Inkscape. In fact, the optimization of the arrangement of electronic components is an automated process in many software, which saves a lot of time.

In this tutorial we will use only free software and available online. There are of course alternatives even more professional, but will not discuss.

Download and install inkscape and fritzing

- connect to www.fritzing.com (/page/1047328/2012-12-23/http://www.fritziong.com/)

- download the software

- follow the installation instructions

- connect to www.inkscape.org (/page/1047328/2012-12-23/http://www.inkscape.org)

- download the software

- follow the installation instructions

Open Fritzing
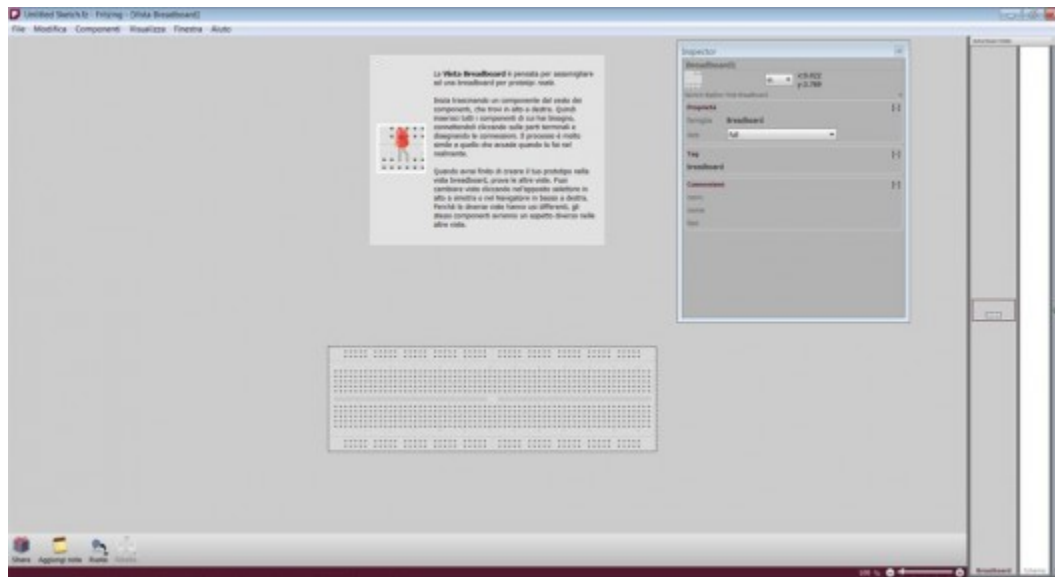
The structure is quite simple:

on the top there is the **Menu Bar**

Navigator on the right (allow to switch between views of the circuit)

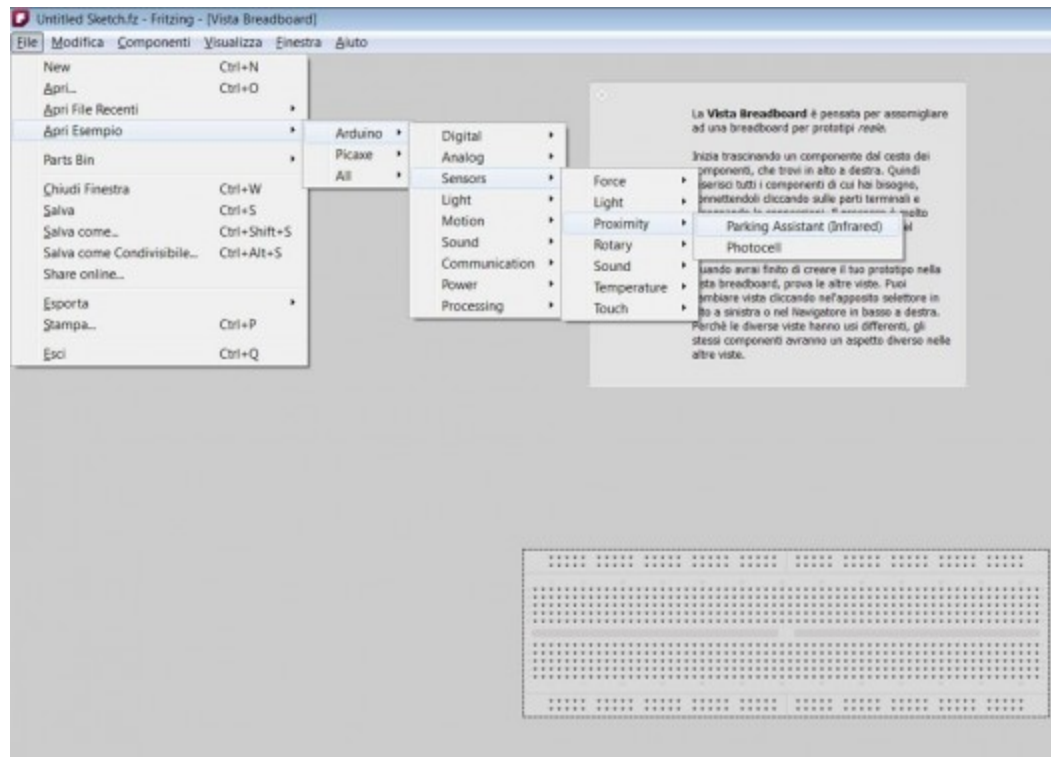**Workplace** in the center

Bottom bar on the bottom

Open the sample file

For first try we will create a shield for Arduino with two proximity sensors to measure distance of an object, or a parking sensor.

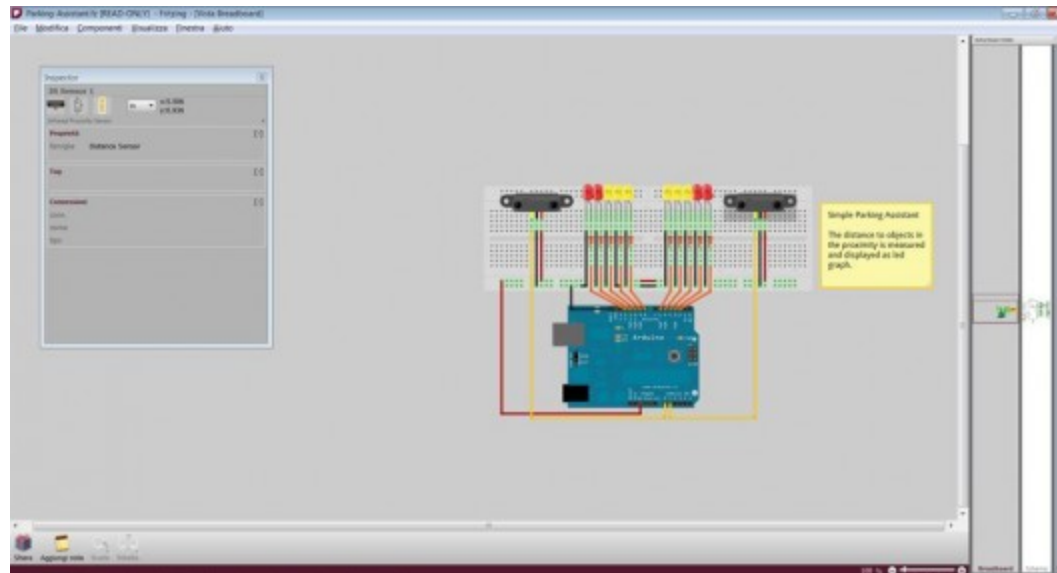It is a circuit complex enough to be interesting

Open the sample file:

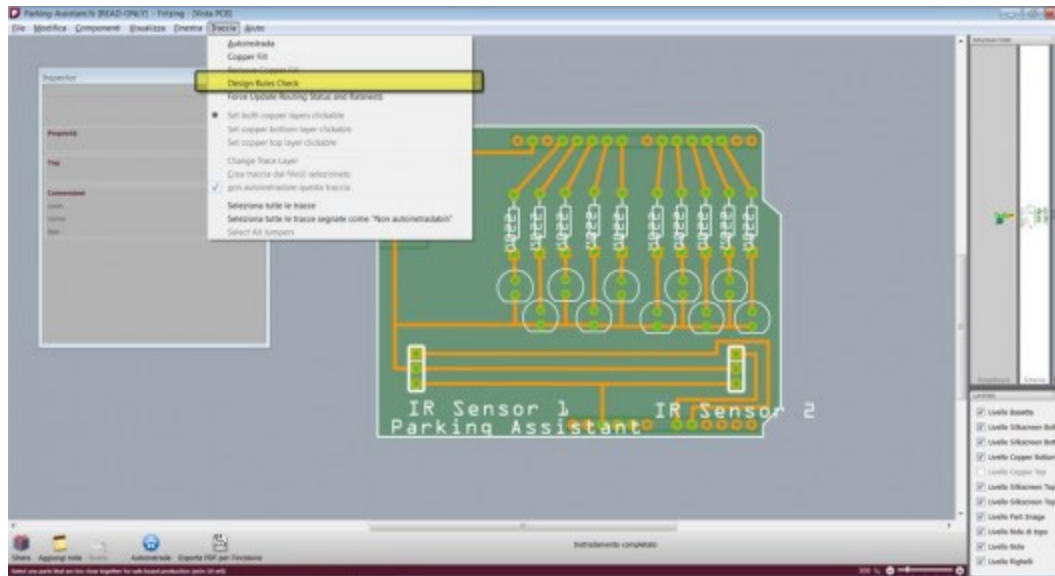**file \ Open Example \ arduino \ sensors \ proximity \ parking assistant (infrared)**

choose display PCB

on the right of the screen, the last of the three possible views of the Navigator
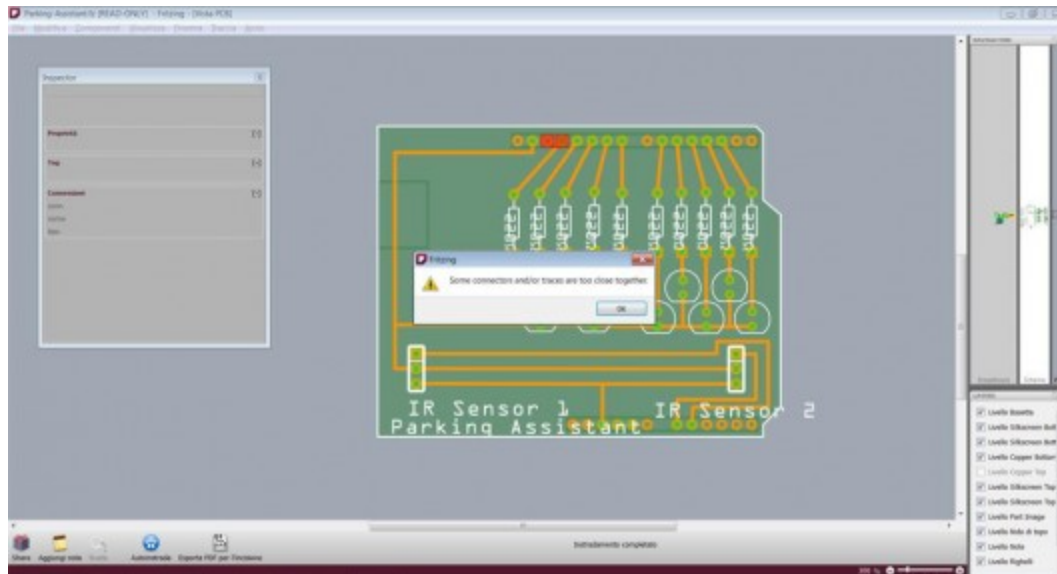

**verify that the tracks design is correct:**

tracks \ design rules check

in this case, the software finds an error: two tracks are too close together, the risk is that they are not milled or difficult it is to solder the components

Tracks correction:

clicking on the trail you can drag and reposition them. Holding down the Shift key, the software tries to keep a portion of the track vertical, horizontal or 45 °. This makes it more homogeneous distribution.
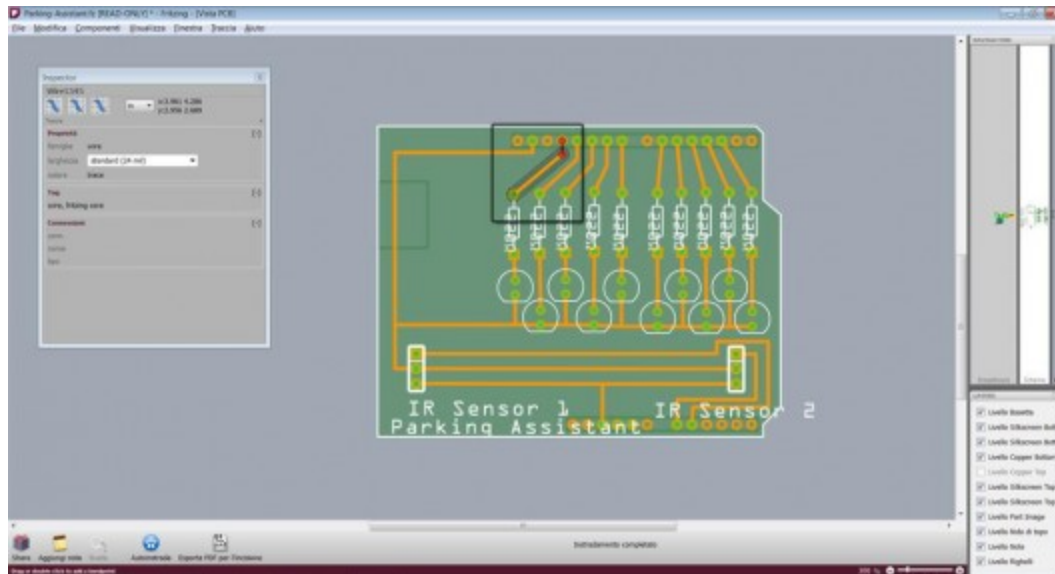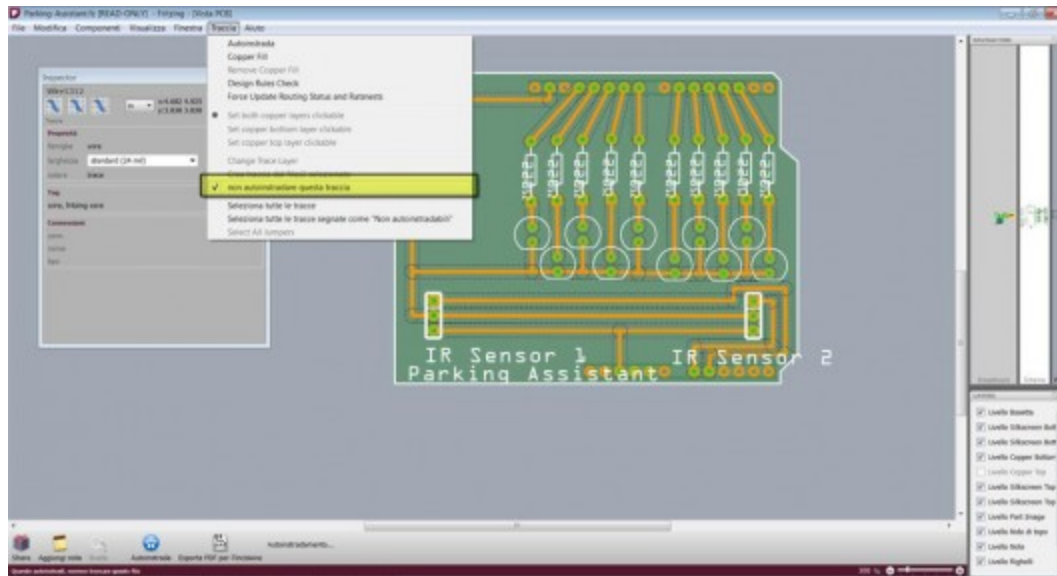
Auto Routing

Fritzing has a self routing algorithm (ie, optimization of the tracks on the PCB), but not fully optimized. To check you can try to auto route the circuit that we have done to correct generated by the sample.

Begin Auto-Routing

Track / Auto-Routing

An error message tells us that some tracks are not self-routable. This is a choice to reduce the number of variables, such as plugging in a meaningful way the Ground and +5 V. We decide to make all the tracks self-routable.

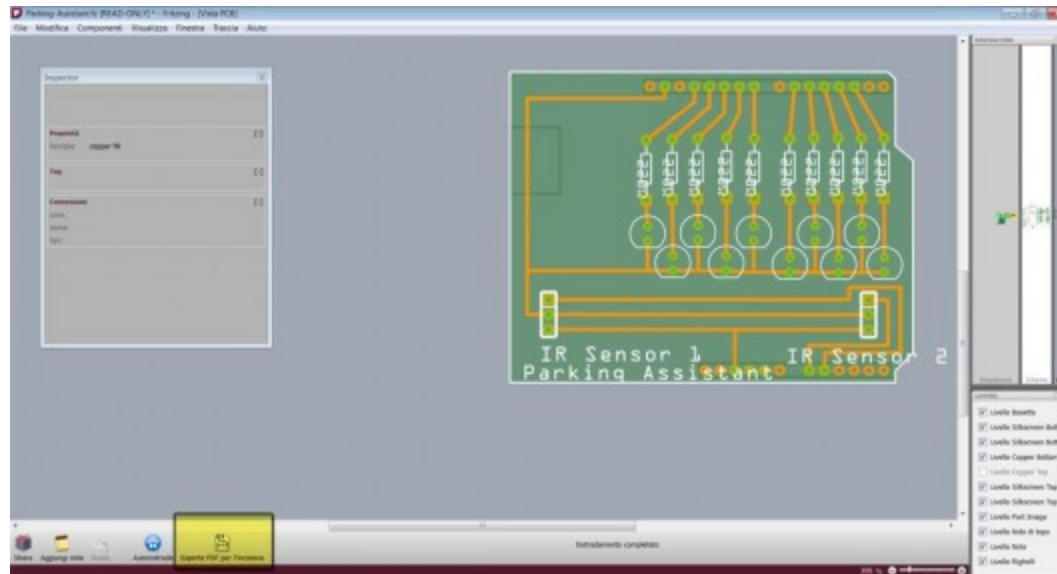## Tracks / not self route this track

Despite the **auto routing** is done on a circuit Fritzing has generated a circuit with several errors (tracks too close together) and a link to do later (as indicated in blue)
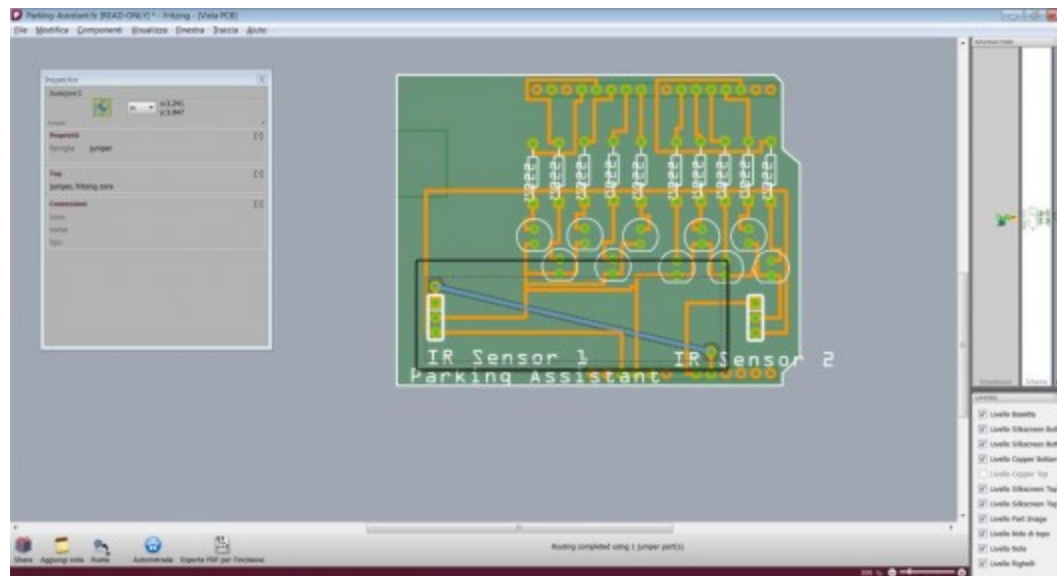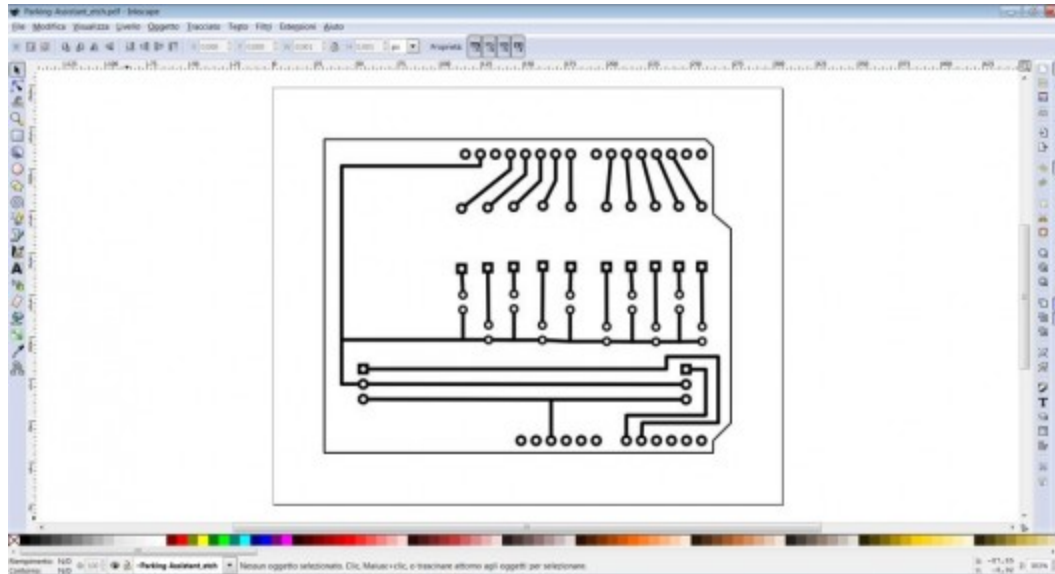
Export PDF

From the bottom bar you can export the pdf for etching circuit. This file is designed for etching, and must be reprocessed to extract the cutter paths.

RE-ARRANGEMENT OF TRACKS OF MILLING

open the pdf generated by Fritzing with Inkscape, the default import settings are fine.

The lines that we see are the paths of the cutter, so where the tip removes material. To have a conductive trace we need two paths at the sides or edges of the line thickness that we see
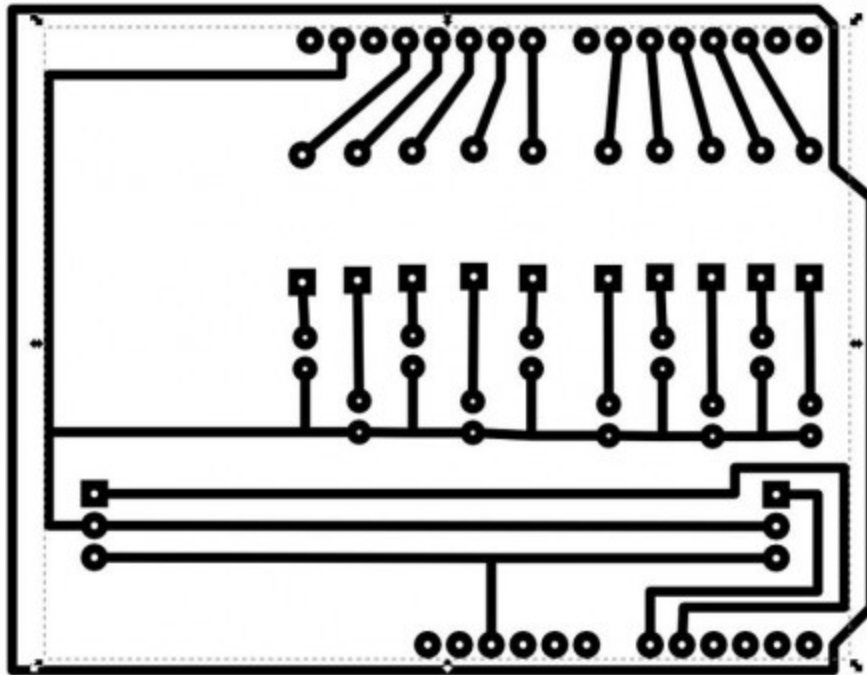
As soon as the tracks are imported we need to divide the tracks, this will probably be repeated several times, until you can select each individual line. The circuit should look like this:
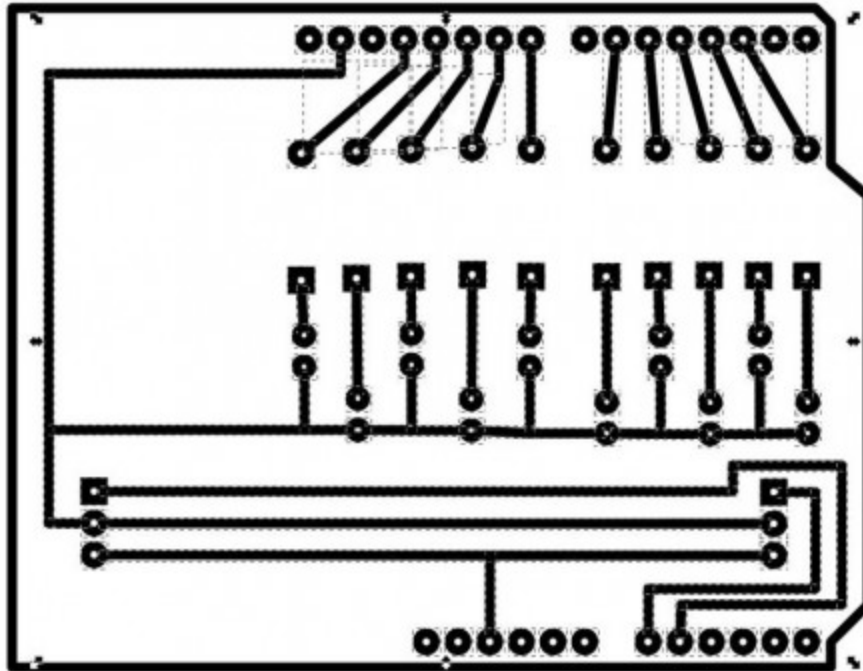
the outer edge is the only track that we do not care to have as a runway. Then select the rest and combine the tracks.
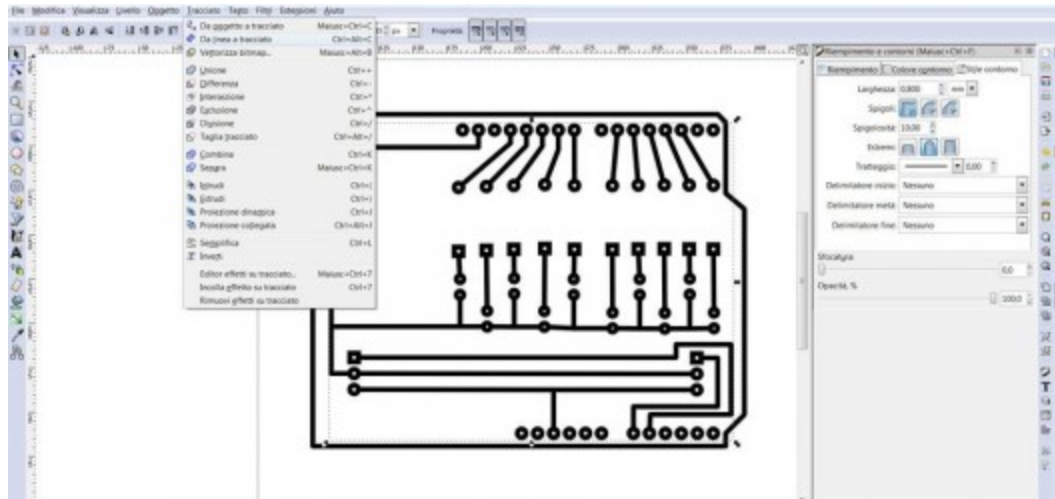
Path \ Combine (Ctrl + K)

At this point it looks like:

now is needed to extract the two edges on the sides of the line. Choosing the width style contour can decide the width of the tracks. The example chosen is 0.8 mm. Now you can convert to a path.

select the inside with the track

track \ line-to-track (Ctrl+Alt+C)

to verify that the file is ready is needed display the paths without fills

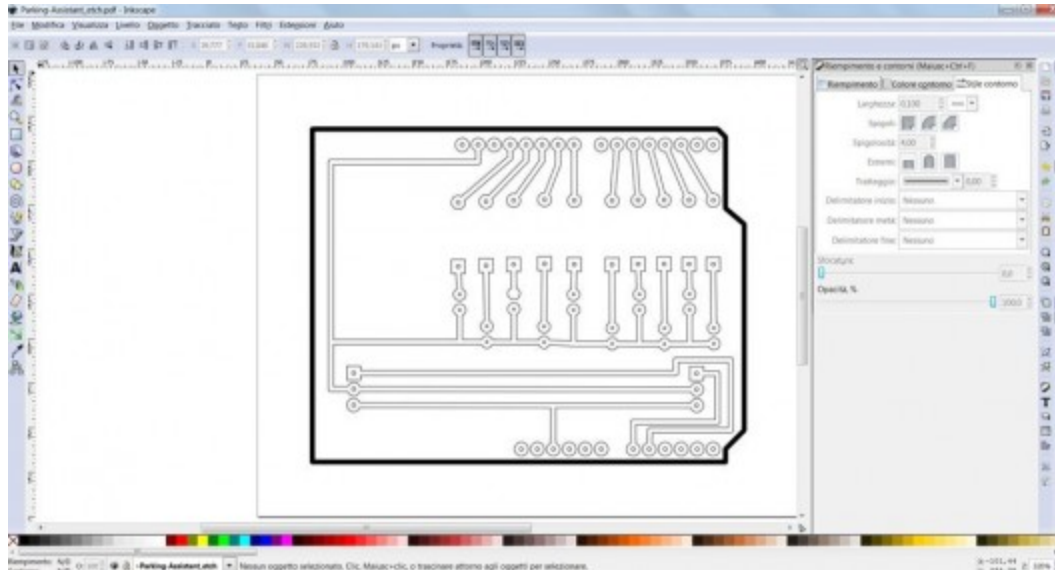select all

Object \ Fill and Stroke (Shift + Ctrl + F)

At this point you open a panel on the right, where you can track the action on three aspects:

Filling: Click on X (**no fill**)

Outline Color: click the second button (**uniform color**)

**border-style**: Choose a narrow width (eg. 0.2 px)

now the file should show the contours of each track

is very important that the software that will perform the incision is clear what is to be preserved (inside) and take off (external). At this time the circuit is formed by two overlapping paths but not connected to each other. Subtract the area of the tab area of the tracks.
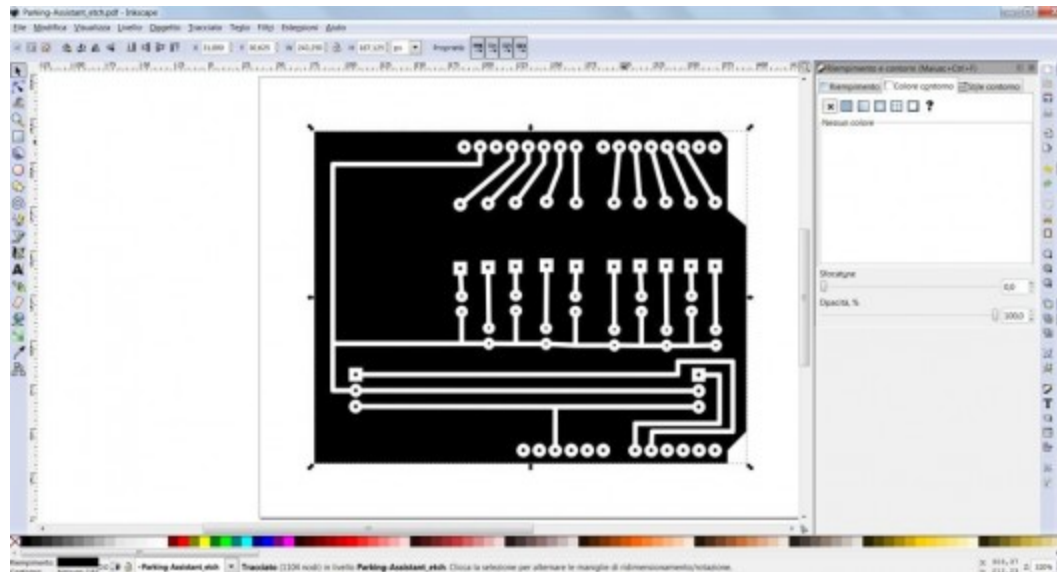
Select both paths

path \ difference
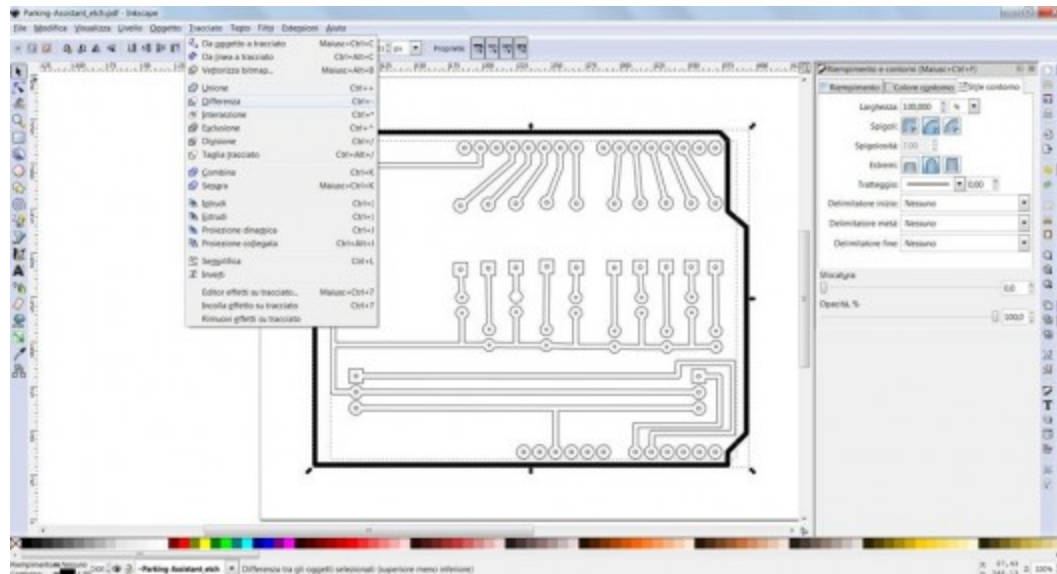
From fill and outline

Filling: click the second button (**uniform color**)

Outline Color Click on X (**no color**)

the only two formats are importable from iModela are .eps and .ai

Inkscape can export to eps but the software fails to open normally Roland.

The conversion must be done with other software.

Images:

(/page/1047328/2012-12-23/http://scuola.arduino.cc/en/sites/arduino/files
/imagecache/browser_view/imagefield_default_images/ard-logo.png)

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