

Speed Monitor powered by 24GHz radar

How to build

About this document

Scope and purpose

This Application Note is intended to enable users to build a speed monitor combining the Infineon [Demo Sense2GoL](#) 24GHz radar evaluationboard with an [XMC2Go](#) microcontroller.



Figure 1 Speed Monitor

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1 Laser Cutting

The wooden parts of the speed monitor are laser cutted. The cutter used works with raw material of up to 800x450mm.

The parts are cut out of 3mm wood. You will need a piece of: 670mmx400mm (3mm)

The lines shown in red are cut lines, other colors will be engraved.
Keep also the “lost” parts of the display as you will need them.

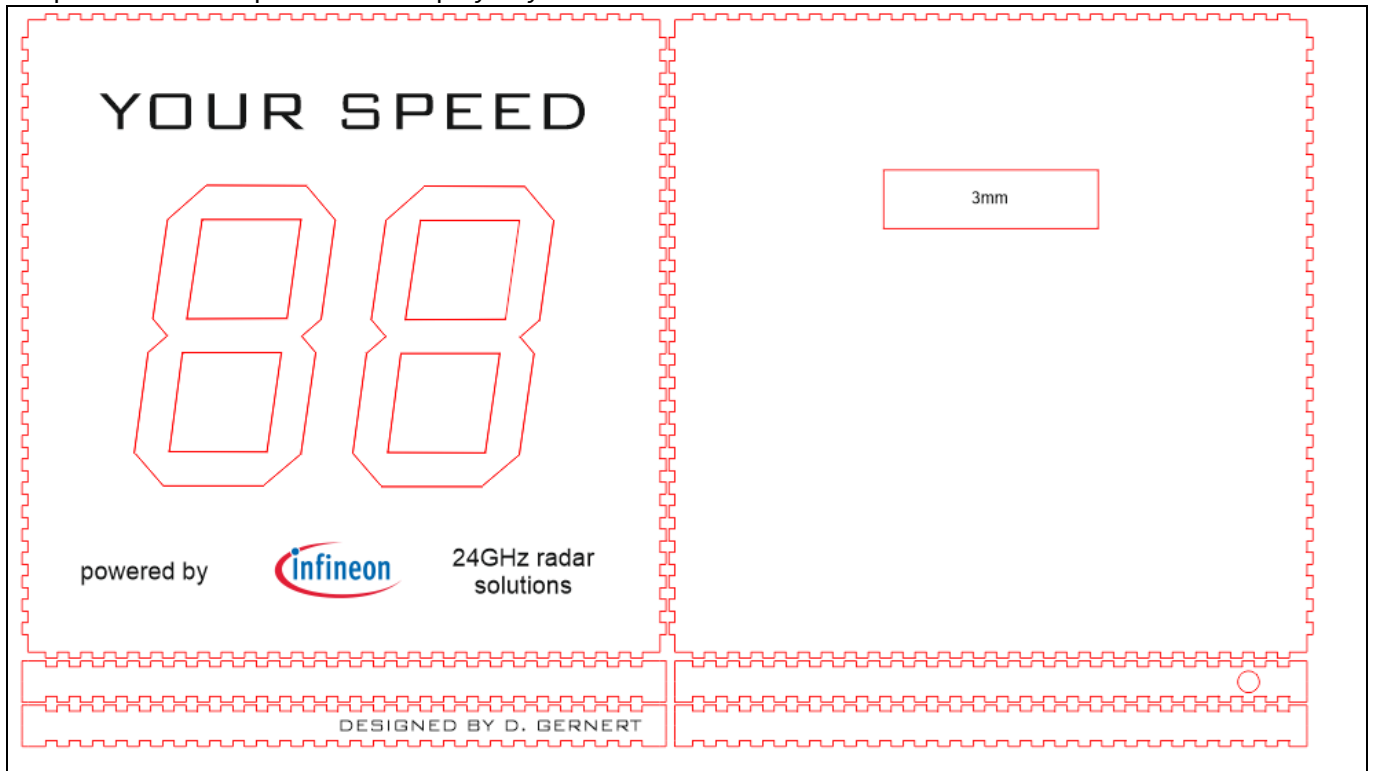


Figure 2 Lasercut layout

2 Display

For the display we used two [7-segment 6.5" displays](#) as well as the suitable [drivers](#).
Desolder the “dots” of the displays, solder the drivers onto them and glue the displays in the wooden frame.
Also glue the “lost” wooden parts into the inner space of the displays.

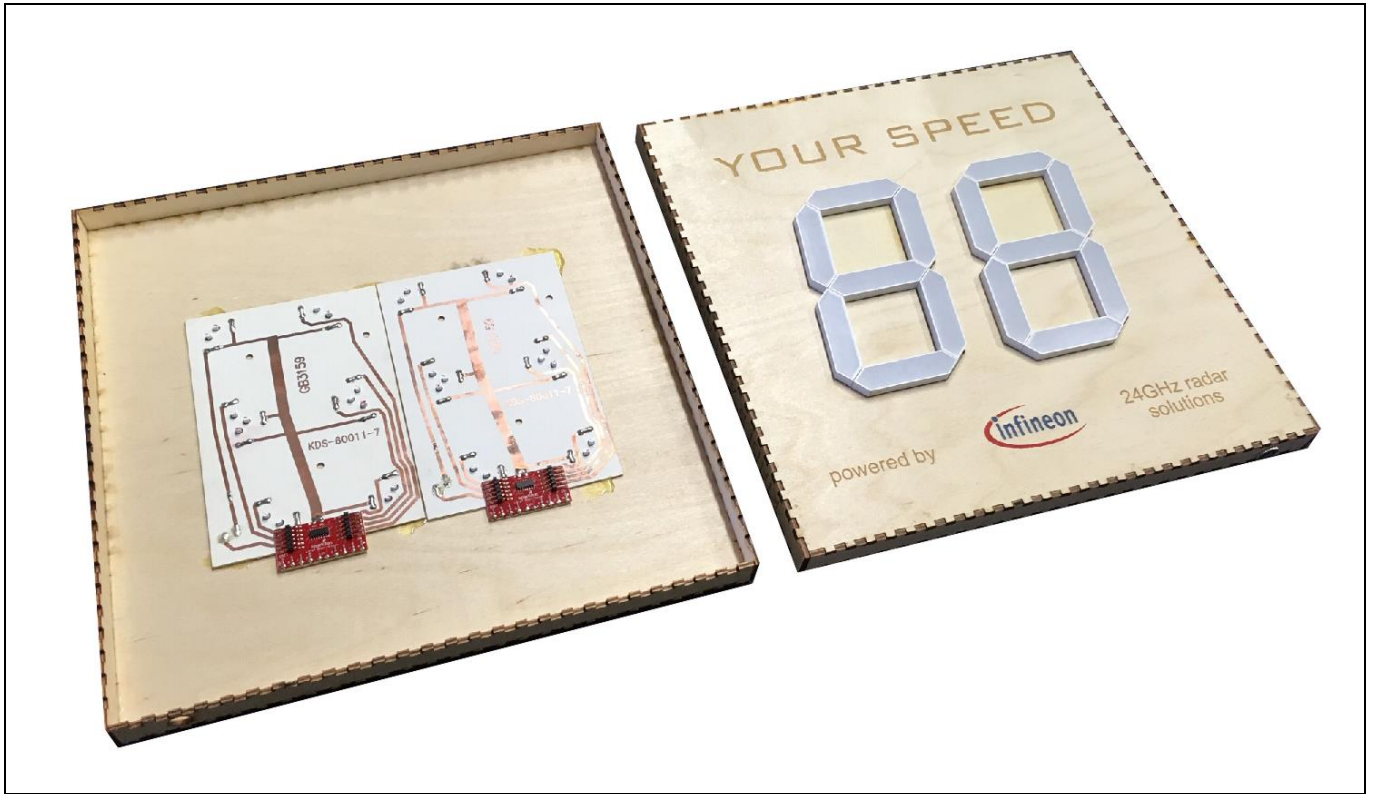


Figure 3 Display glued into the wooden frame

3 Hardware assembly

Glue the two 20x20mm pieces on top of each other. This stack is glued on the Sense2GoL board to keep a distance of about 6mm from antenna to the wooden enclosure.

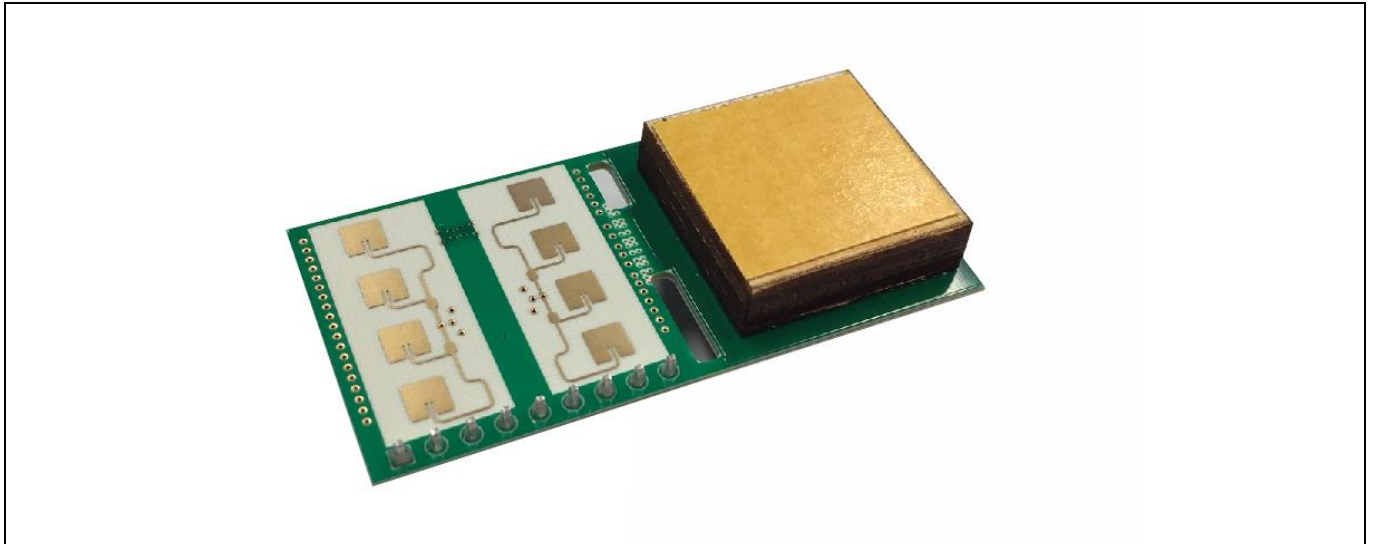


Figure 4 Distance pad on Sense2GoL

Glue the Radar module centered underneath the Display (behind the Infineon logo), the 12 to 5V DCDC converter on the left and the XMC2Go on the right.

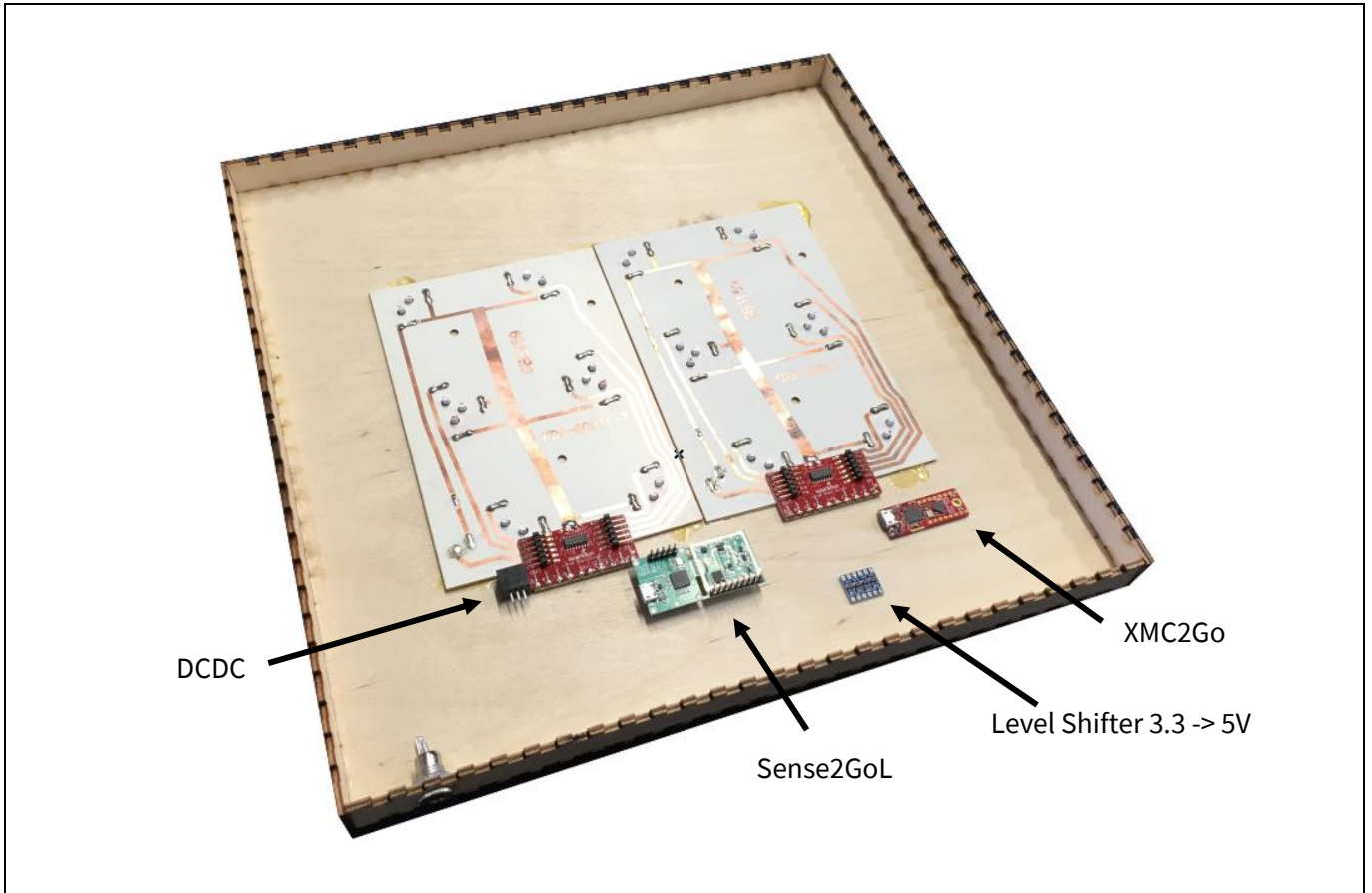


Figure 5 Sense2GoL position

4 System Setup

The system consists of five main parts:

- Sense2GoL radar module
- XMC2Go microcontroller
- Two 7-segment displays and drivers
- 12V->5V DC/DC converter
- Level shifter 3.3V -> 5V

The radar module is sending the speed information via a PWM interface to the XMC1100. The signal needs to be shifted as the Sense2GoL runs on a 3.3V logic level but the display drives work only with a 5V logic. The XMC controller then sets the display accordingly via a 3-wire interface (latch/clk/data)

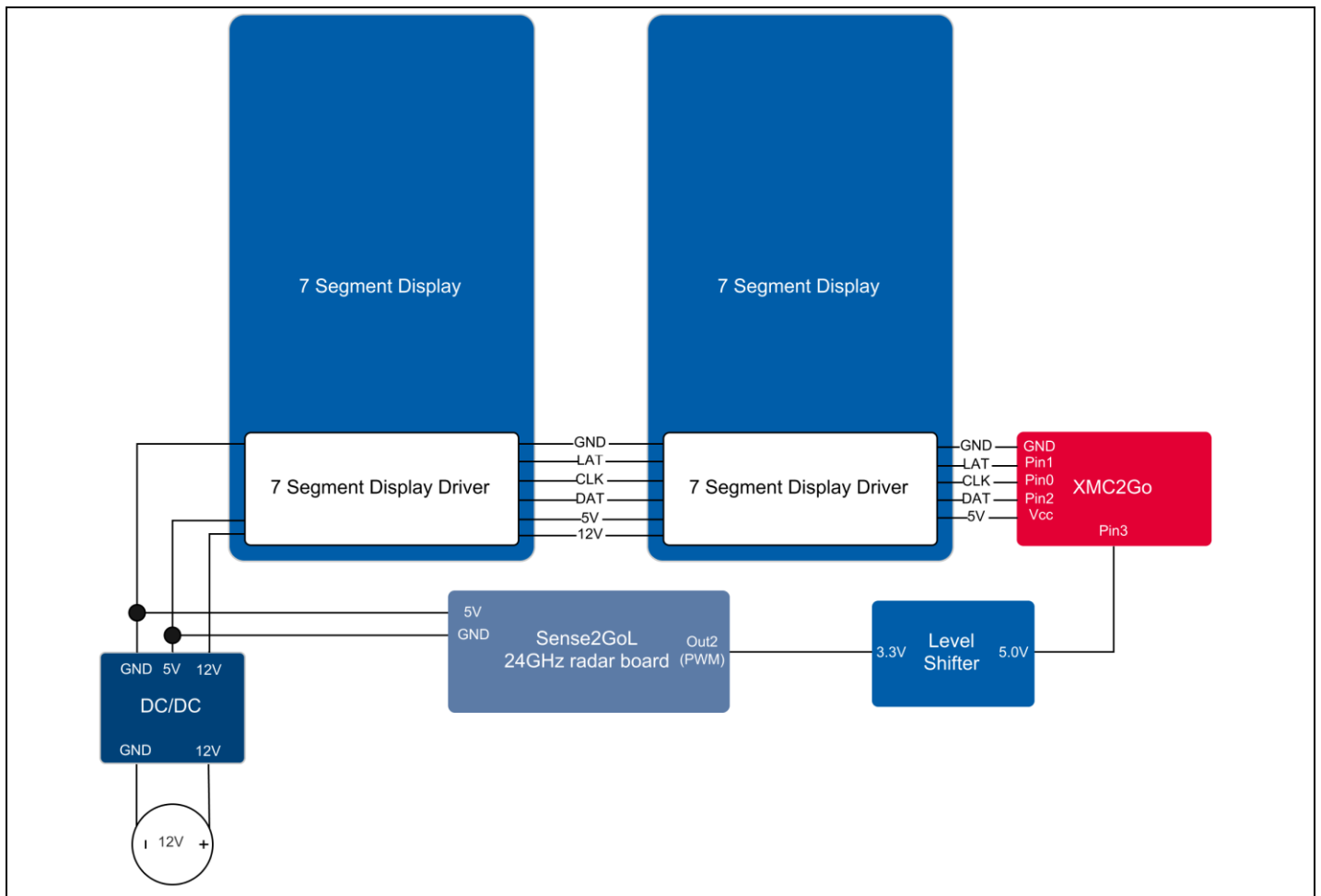


Figure 6 System Setup

5 Electric connections

Connect the DC/DC converter to the power plug and the left display drivers GND, 5V and 12V.

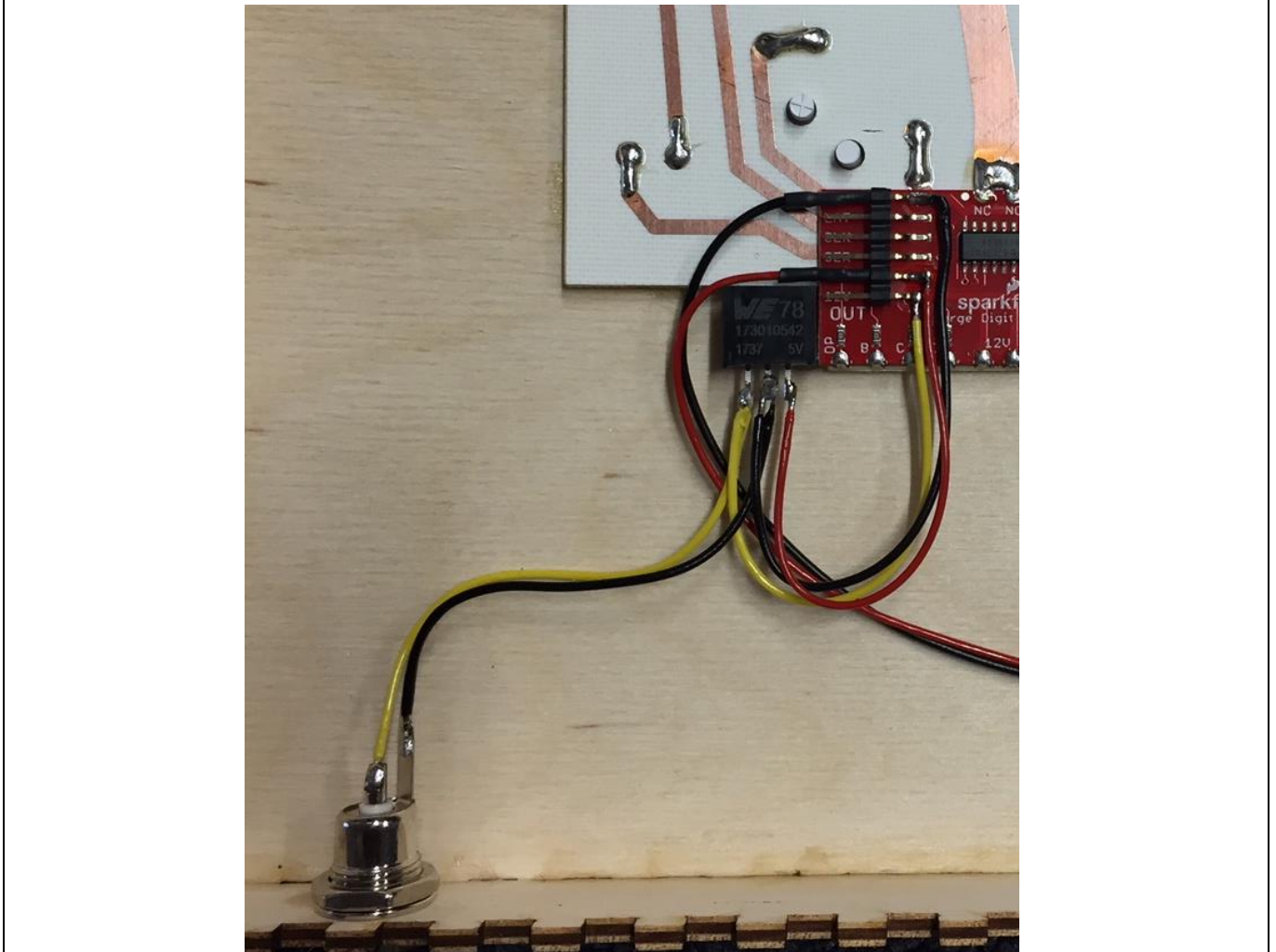


Figure 7 DC/DC power supply

Connect also the 5V and GND pins of the driverboard to the Sense2GoL

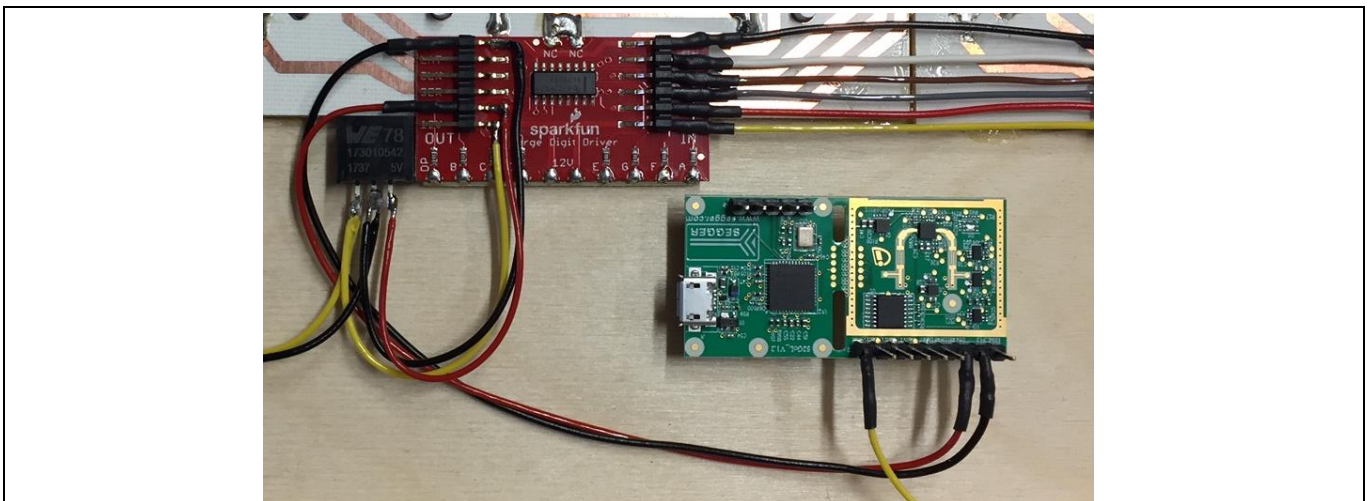


Figure 8 Sense2GoL power supply

Connect the drivers to each other as well as to the XMC2Go.

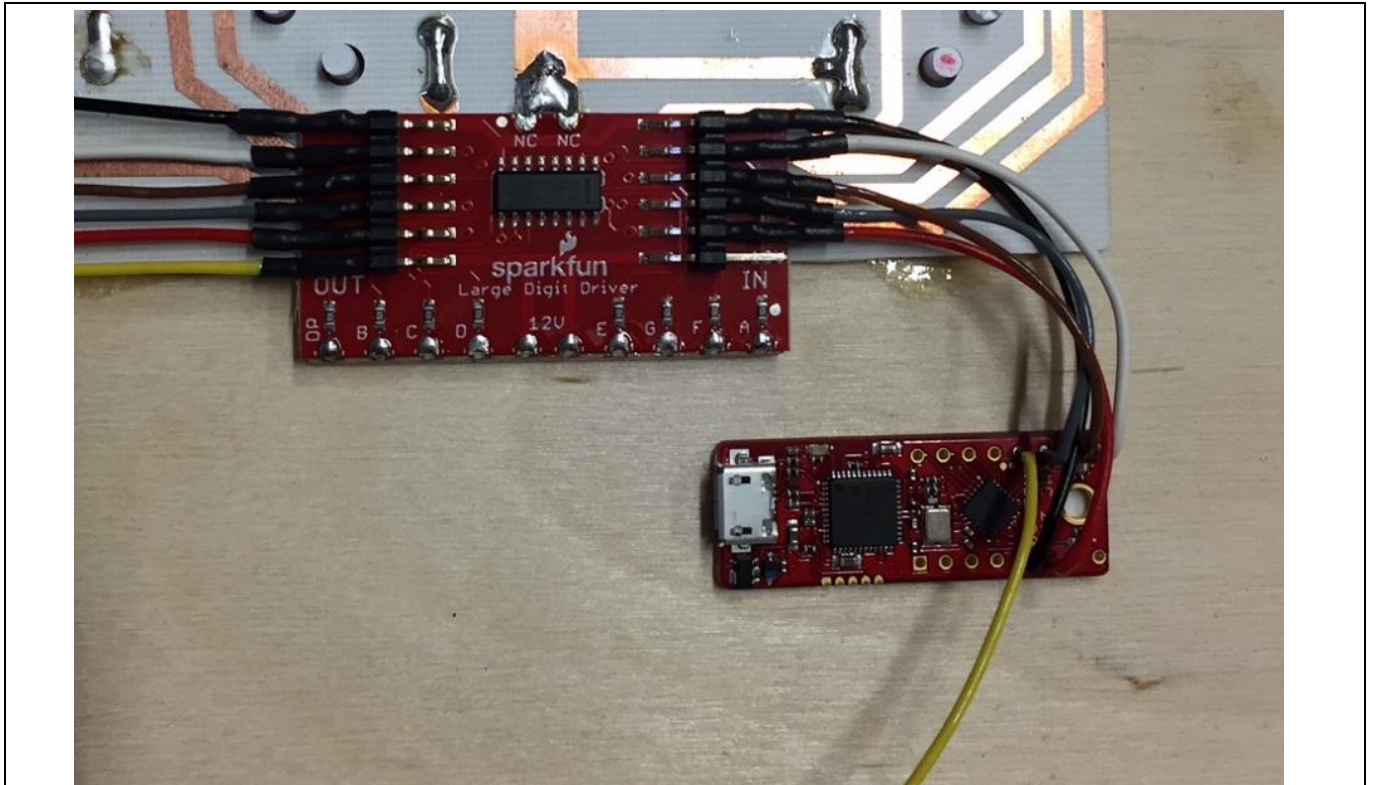


Figure 9 Display driver and XMC2Go

Finally connect the Sense2GoL board to the XMC2Go

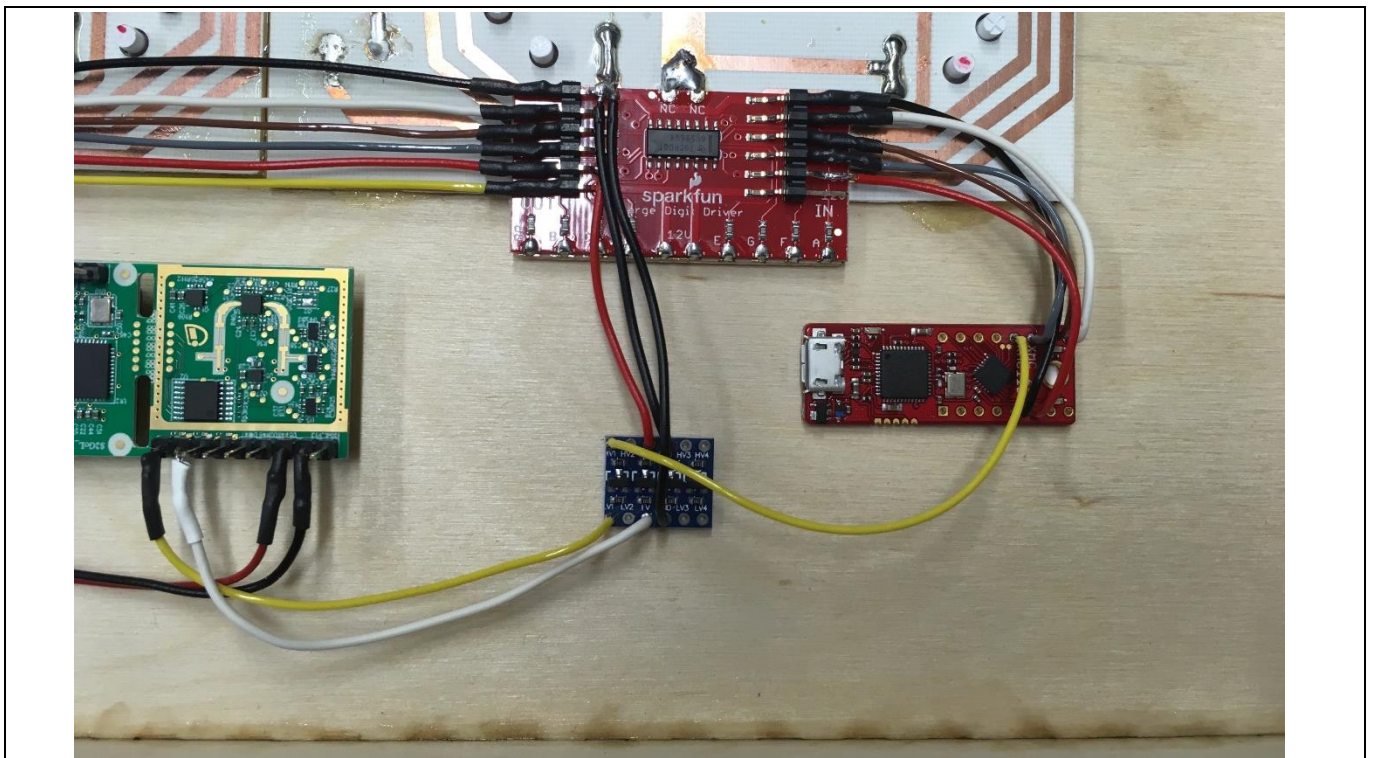


Figure 10 Sense2GoL data connection

6 Software

Flash the “S2GL_Doppler.hex” file onto the Sense2GoL and the “XMC1100_speed_monitor.ino.hex” to the XMC2GO.

The easiest way to do so is to use the XMC Flasher which is available via the [Infineon Toolbox](#).

- Click on connect and choose the “XMC1302-0016” (S2GoL) or “XMC1100-0064” (XMC2Go)
- Select the .hex file and click on Program

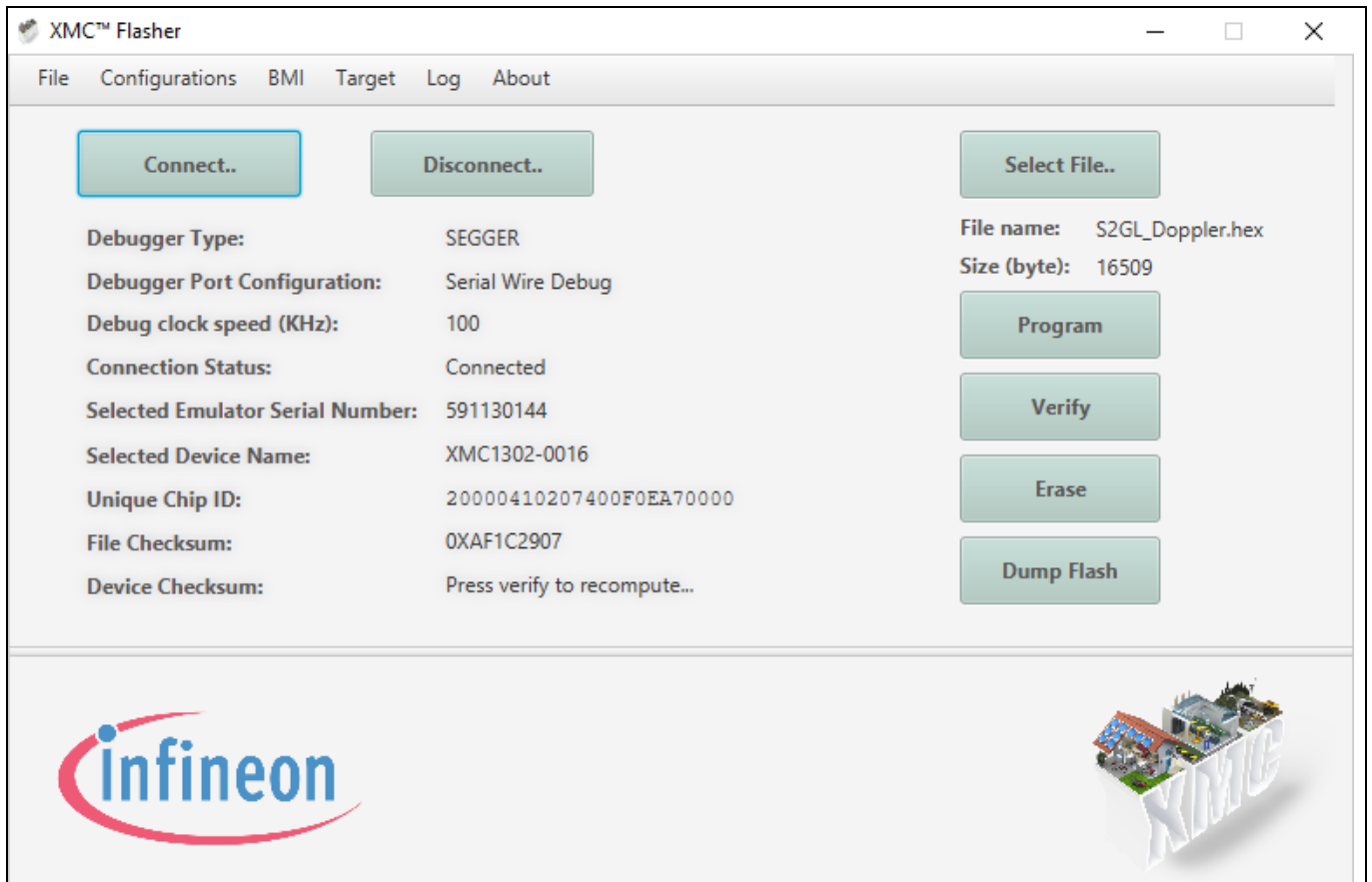


Figure 11 XMC Flasher

Revision history

Document version	Date of release	Description of changes
V1.0	23.08.2019	Initial release

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