Car Sig Gen: Quick Start Guide

Draft 01/08/2022 (HOF)

This is the manual for the ABS SIG GEN 01.08.22 firmware running on the STM32 NUCLEO-F072RB board. It implements the Car Sim's signals for testing purposes as described in the 'Term-3 Project : Car Sim + ABS Controller with FreeRTOS' and is not a simulator per se. Also, it is not a reference implementation and where the specification differs from the implementation, the specifications shall prevail.

The following has been implemented:

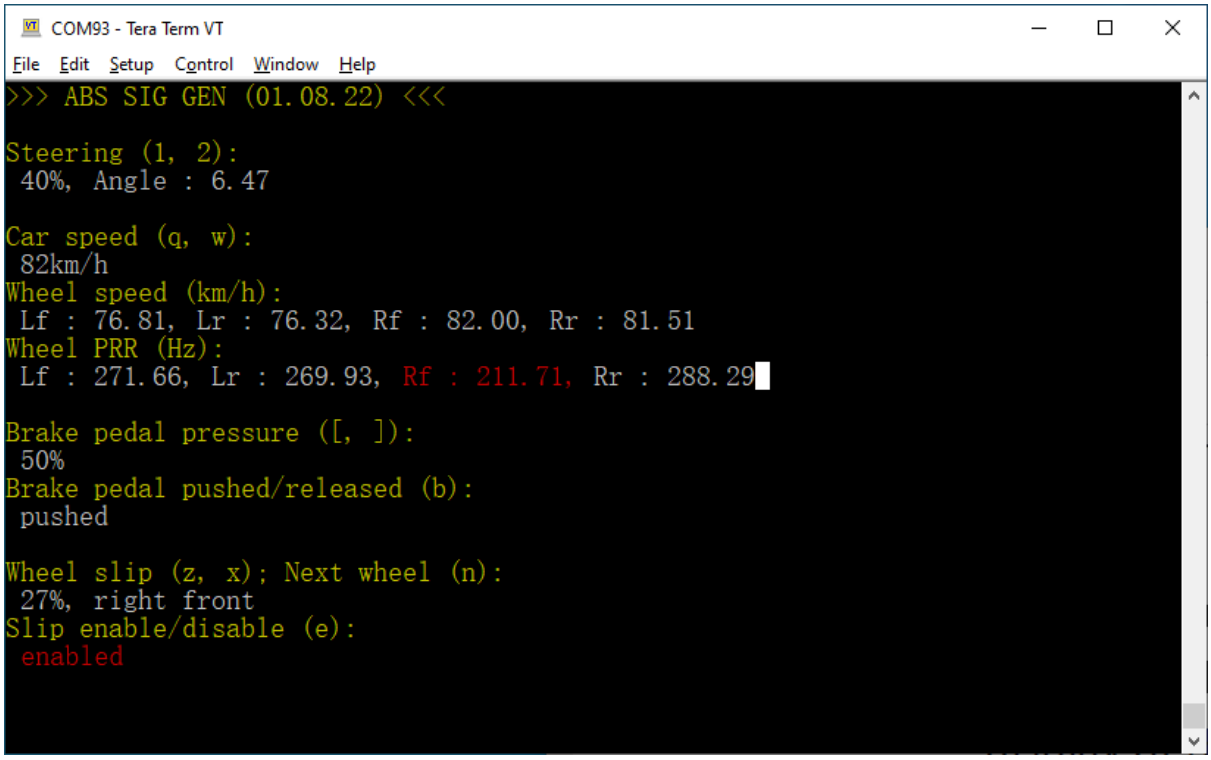
- wheel encoder pulses (4x);
- steering wheel position PWM (@ 200Hz);
- brake pedal pressure PWM (@ 100Hz);
- brake pedal pushed or released;
- wheel slip and lockup through menu.

Note: The wheel encoder pulses are generated using four firmware interrupts, which may cause some slight jitter. Each user change affecting the pulse repetition rate will stretch a single pulse's mark or space by about 40us.

Instructions:

Open tera term (win) or screen (max, linux) with the following settings:
Baud: 115200 8-N-1

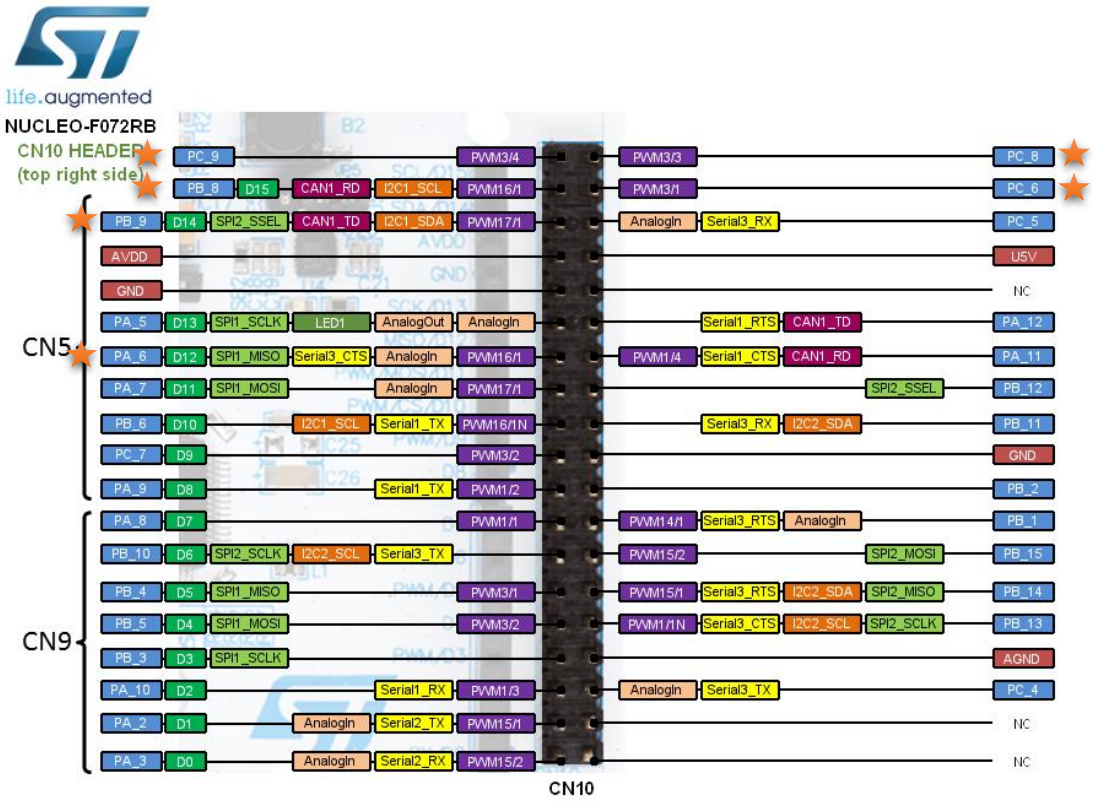
The screen will be blank. Press 's' to start the simulator. Press single key commands, such as (1, 2) etc. to change items.



The brake pedal needs to be 'pushed' for the brake pressure PWM signal to become active.

Morpho Headers Pin Out:

- Left front wheel: PC_9
- Right front wheel: PC_8
- Left rear wheel: PB_8
- Right rear wheel: PC_6
- Steering position: PB_9
- Brake pressure: PA_6



Ref: https://os.mbed.com/platforms/ST-Nucleo-F072RB/