The speed of the motor controller is controlled using PWM and the direction of the motor is controlled using the enable pins A and B. The Nucleo outputs 3 volts and the input is 3 volts, but the encoder uses 5 volt logic. A level shifter is used to convert 5 volts down to 3 volts. Each side of the robot has two motors connected together to provide more torque. The motors share a PWM signal and enable pins on their respective sides. Right motor 1 PWM Right Motor 2 PWM ∅ GND Ø 3 GND TX1 VIND 1

2 CRX0 GNDD 2

3 CPCT TO Left Motor 1 PWM Left motor 2 PWM @ GND Ø Right Motor 1 En A 4 CGND 5V> 4 5 CD2 A7> 5 6 CD3 A6> 6 7 CD4 A5> 7 1 dv1 HV1 1 2 dv2 HV2 2 Encoder left A Right en A Right Motor 2 En A ❷ Encoder left B 3 LV HV 3 4 GMD GND 4 5 LV3 HV3 5 Right motor 2 En B **⊚** 5∨ 8 CD5 A4> 8 Left motor 1 En A S GND 9 (D6 A3) 9 10 (D7 A2) 10 Left Motor 1 En B 2 3
Left motor 2 en A 4
Left motor 2 en B 2 S Encoder Right A Left En A 6 LV4 HV4 6 11 CD8 A1> 11 12 CD9 A0> 12 Left En B Level Shifter 13 (D10 AREE) 13 14 (D11 3v3) 14 15 CD12 D13> 15 Sheet: / File: MotorNucleo.sch Title: Size: A4 Date: Rev: KiCad E.D.A. kicad (5.1.5)-3 ld: 1/1