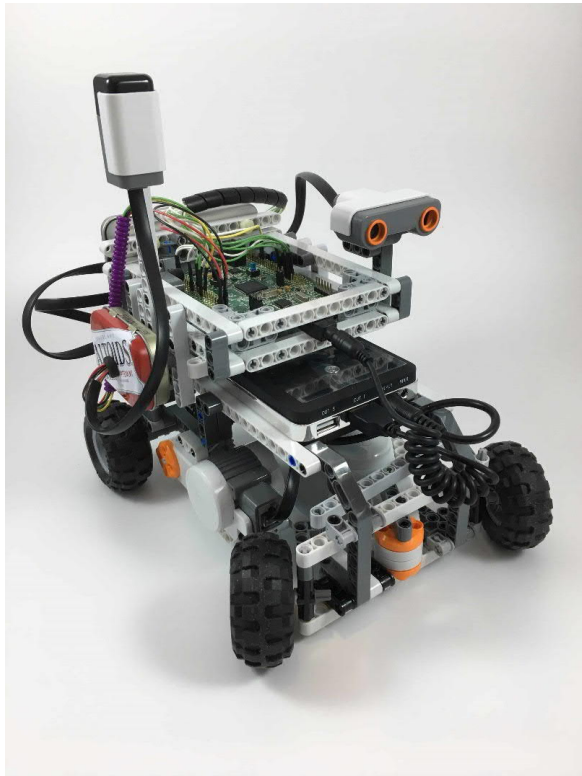# Connection/wiring diagrams for RC Car

The image at left shows the version using the IR Receiver.
We also have a version using Bluetooth instead.

Instructions for building the original car are here:
   http://www.hitechnic.com/models
Note that we modified the car to hold an STM32 Discovery Kit card that replaces the NXT Brick.
A video of their car is available on YouTube:
   https://www.youtube.com/watch?v=KItnZBSvLu4

The Battery

XTPower MP-10000 External Battery Pack with 10000mAh using dual USB 5V and DC 9V / 12V 2A

Ideal because it provides the 9V for the motors and sonar sensor, and 5V for the computer.
(Can use 12V for the motors if desired.)

Modify the F4 Disco target board

- You must disable the blue User button on the F4 Disco board so that the GPIO pin PA0 is available for use by the on-board app.
- To do so, remove (de-solder) solder bridge SB20 described in UM1472 Discovery kit for STM32F407/417 lines document
    - See Table 4 "Solder bridges"
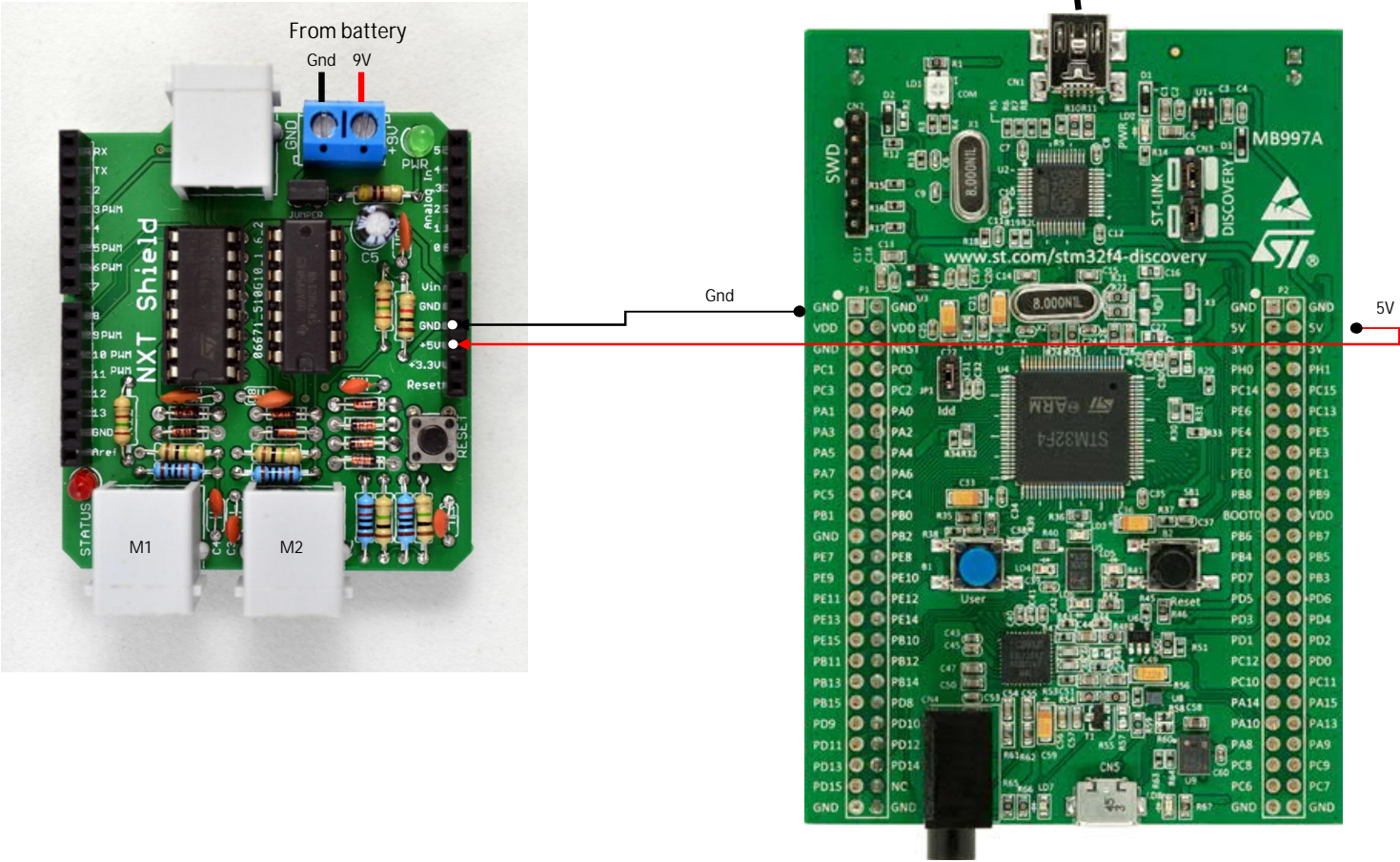   - See Figure 16 for circuit
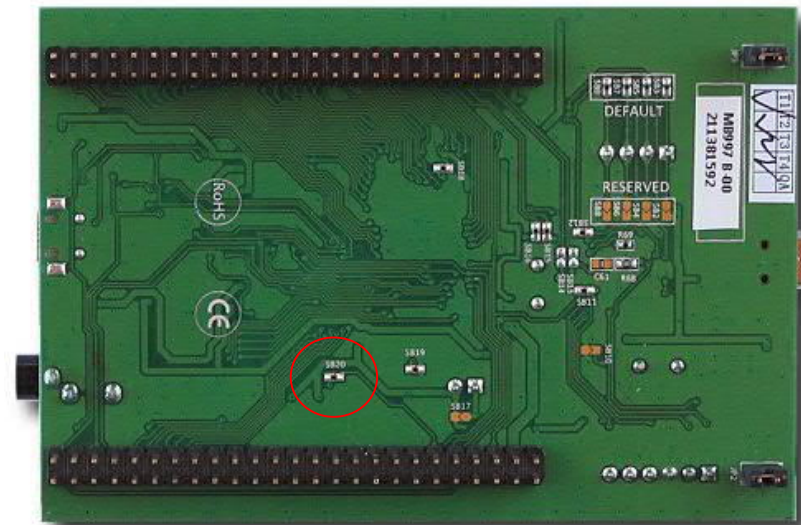
NXT Shield

Provides circuitry for the two motors and the sonar sensor

Kit, available for purchase from http://shop.tkjelectronics.dk/product_info.php?products_id=29

Power to NXT Shield

From battery

Gnd   9V
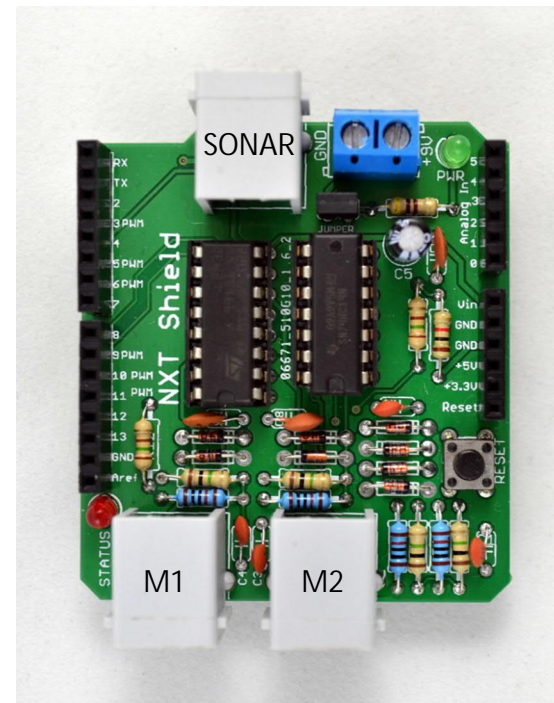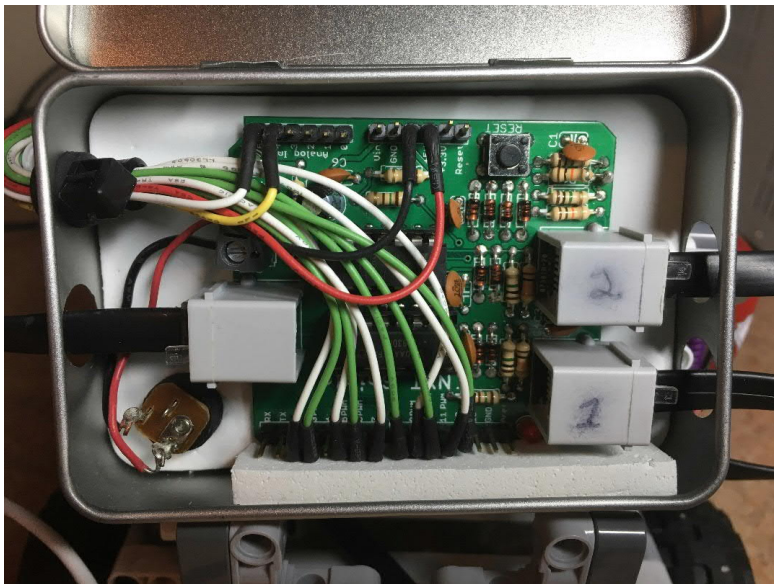
red and black
wires

From battery

Gnd

5V
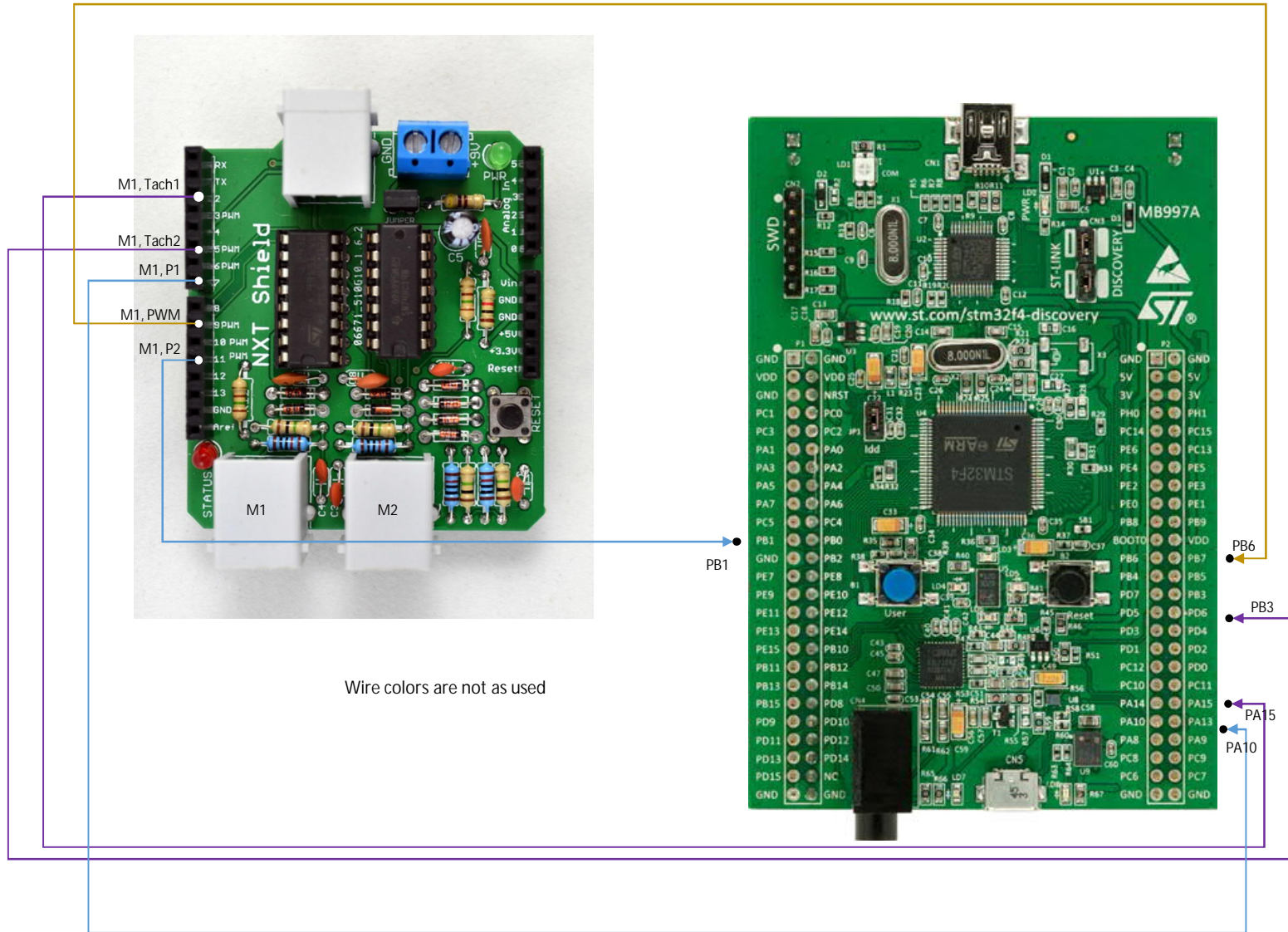
Motor1

NXT2:PA15, Tach1
NXT5:PB3, Tach2
NXT7:PA10, Polarity1
NXT9:PB6, PWM
NXT11:PB1, Polarity2

white
wires

M1, Tach1
M1, Tach2
M1, P1
M1, PWM
M1, P2

PB1

Wire colors are not as used

PB6

PB3

PA15

PA10

Motor2

NXT3:PA0, Tach1 (requires removal of solder bridge SB20)
NXT6:PA1, Tach2
NXT12:PA2, Polarity1
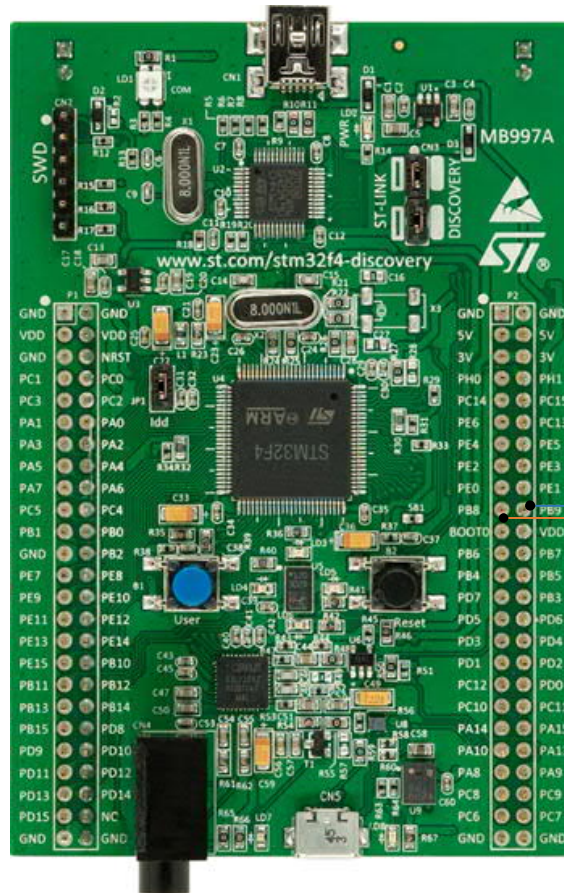NXT10:PB4, PWM
NXT8:PA3, Polarity2

green
wires

M2, Tach1
M2, Tach2
M2, P2
M2, PWM
M2, P1

PA1 PA0
PA3 PA2

PB4

Wire colors are not as used
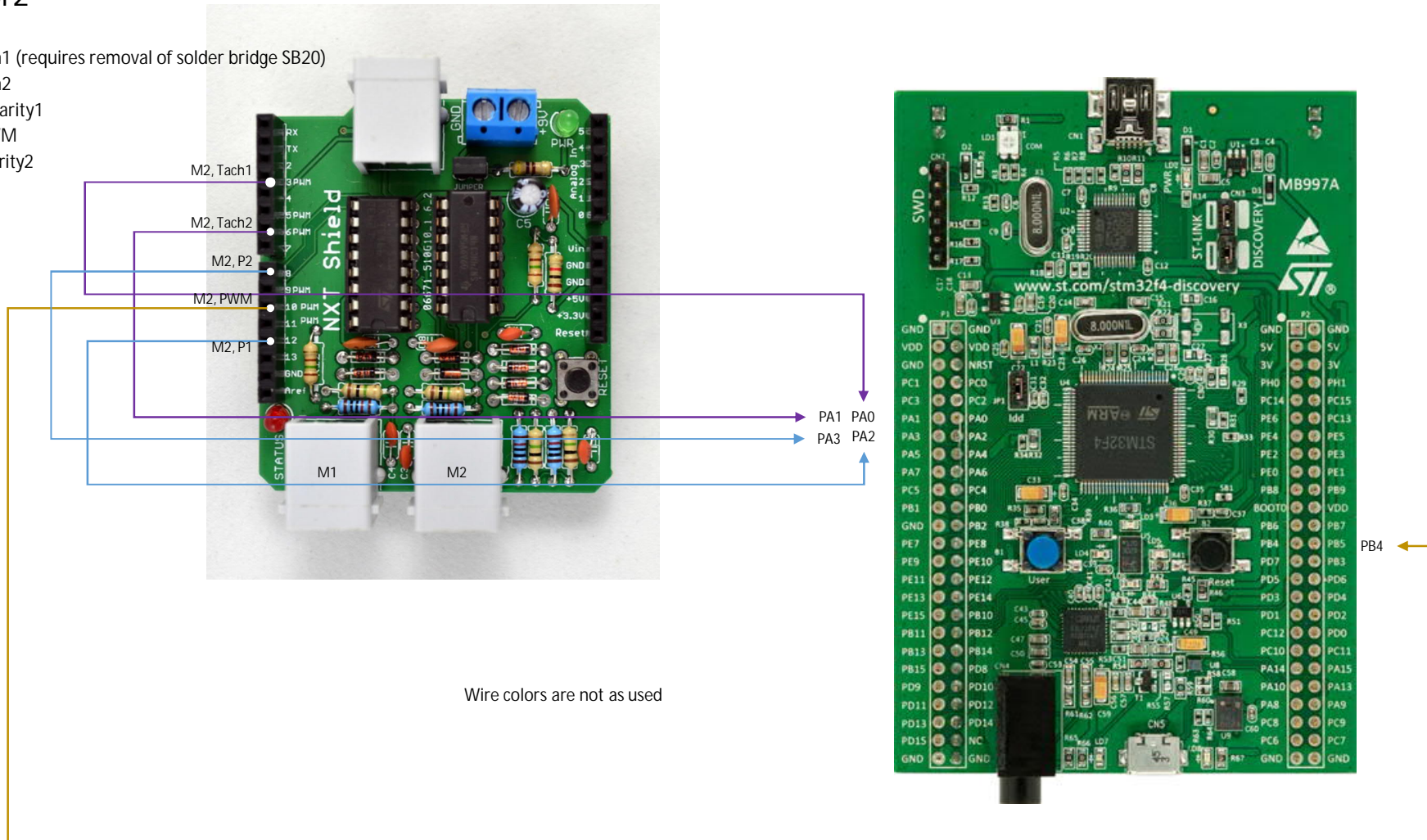
HiTechnic IR Receiver

Vin: 5V
Gnd: Gnd
SDA: PB9
SCL: PB8

Using I2C #1

Wire colors are not as used

Altoids container

Gnd

Vin

5V

R1 ⩾ 10k

SDA

5V

R1 ⩾ 10k

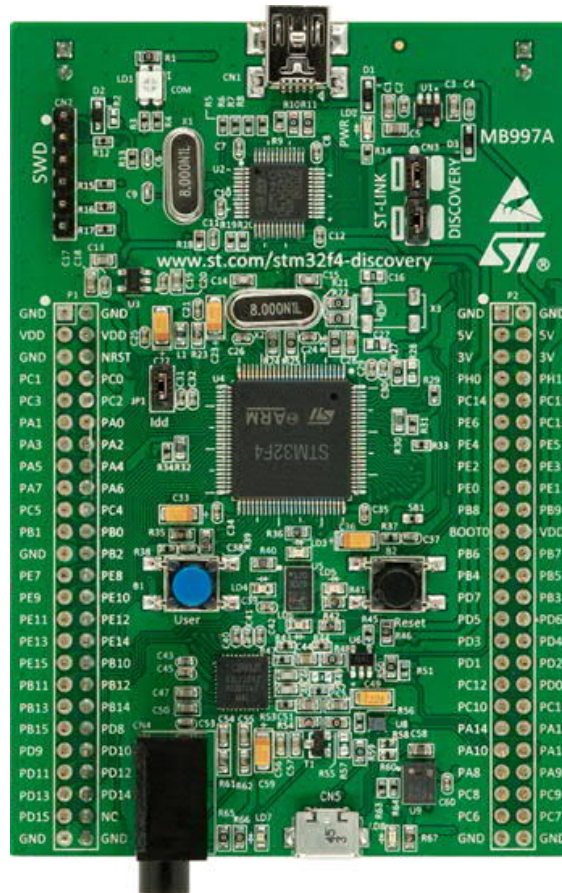SCL

Gnd

5v

PB9

PB8
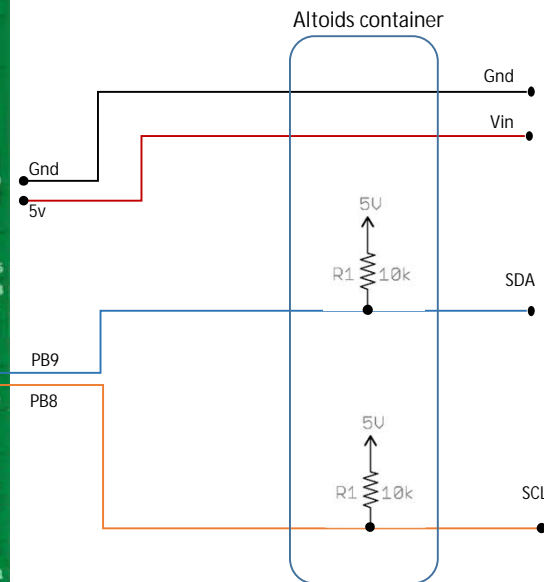
Resistors are in the Altoids can.
Power and ground lines go to the Altoids can, then from there to the sensor.
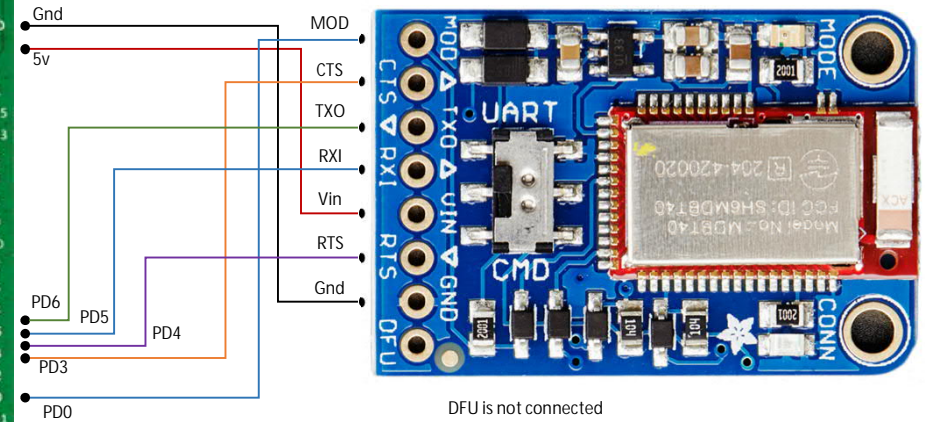The sensor lines go into the Altoids can.

Bluefruit LE Friend UART

Vin: 5V
Gnd: Gnd

MOD : PD0;
CTS : PD3;
RTS : PD4;
Tx : PD5; -- RXI pin on breakout board
Rx : PD6; -- TXO pin on breakout board
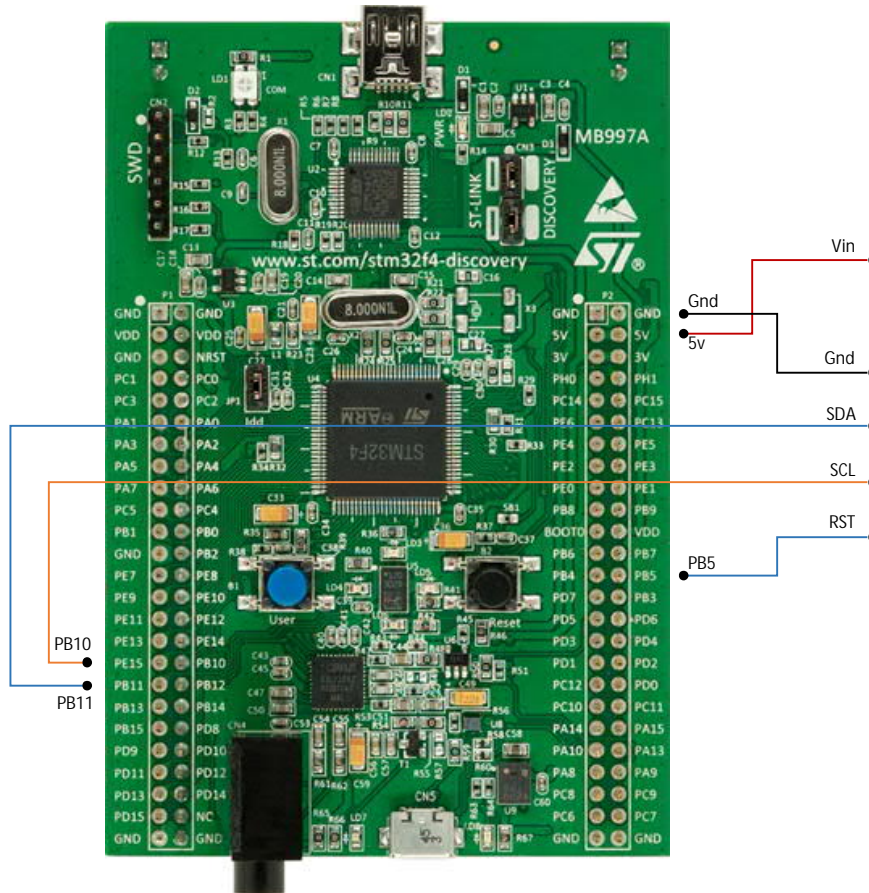
On USART #2
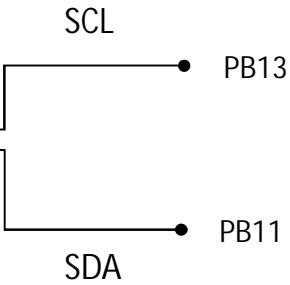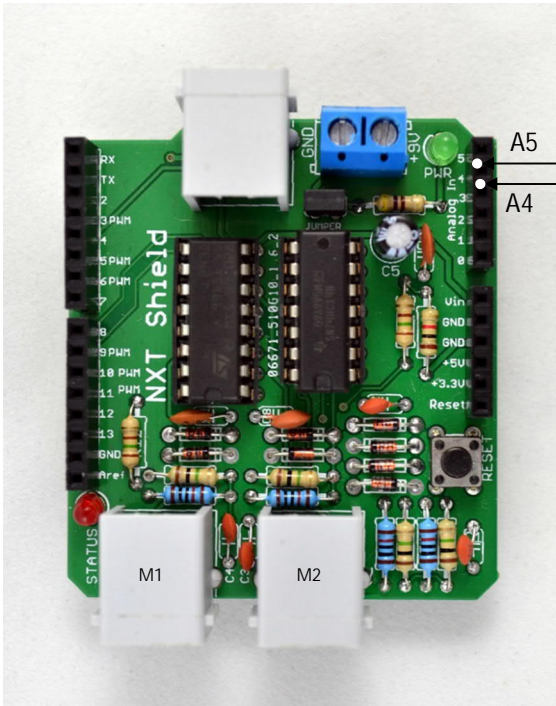
Wire colors are not as used

Gnd
5v

PD6
PD5
PD4
PD3
PD0

MOD
CTS
TXO
RXI
Vin
RTS
Gnd

DFU is not connected

Bluefruit LE Friend SPI

Vin: 5V

Gnd: Gnd
SDA: PB
SCL: PB

Wire colors are not as used

Vin

Gnd

5v

Gnd

SDA

SCL

RST

PB5

PB10

PB11

Ultrasonic
Sensor

SCL

A5 ———————————• PB13

A4

SDA ———————————• PB11

This is for a 9-volt sensor,
not an A/D sensor