Locoduino III

This is a library for Arduino to handle buttons, **Dcc** (Railroad Modeling), CAN bus, I2C bus, or serial interface to give orders. This report is found under Tutorial 178 from maXbox Starter Series.

LOCODUINO – Comment piloter trains et accessoires en DCC avec un Arduino (1)

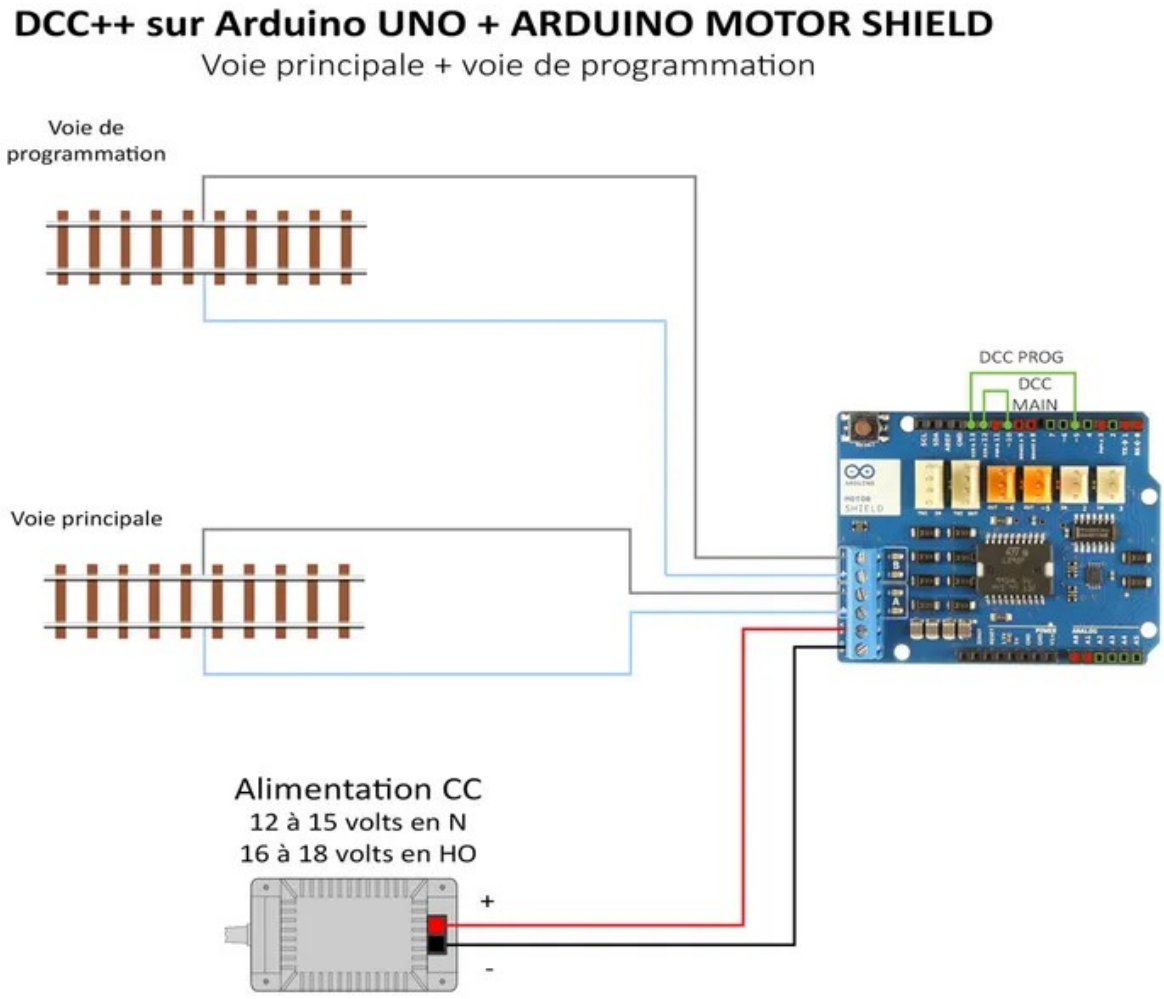
As before I tested with a motor shield from Arduino reported at:

Railuino II – Trans Europ Express

This time we test a configuration with a DC Loc and a Power Supply. First, each bit comprises half a period in the low state (0) and half a period in the high state (1). At the end of this half-period, we must move to the next bit by traversing the message memory area, byte by byte (loaded into the variable).

```
outbyte = msg[msgIndex].data[byteIndex]).
```

The **Arduino Motor Shield** is a versatile add-on board designed to control DC motors, stepper motors, and servo motors. It is based on the **L298 dual full-bridge driver**, which allows it to handle inductive loads like motors and relays. This shield is ideal for robotics and automation projects, enabling precise control over motor speed, direction, and current sensing.



Schema: with Motor Shield on Arduino Uno

Note that with both the UNO and the MEGA, you will need to cut the V-IN Connect connection under the motor shield as link shown below. Use a cutter carefully to avoid cutting beyond the area in question, and ensure that the connection is

completely severed.

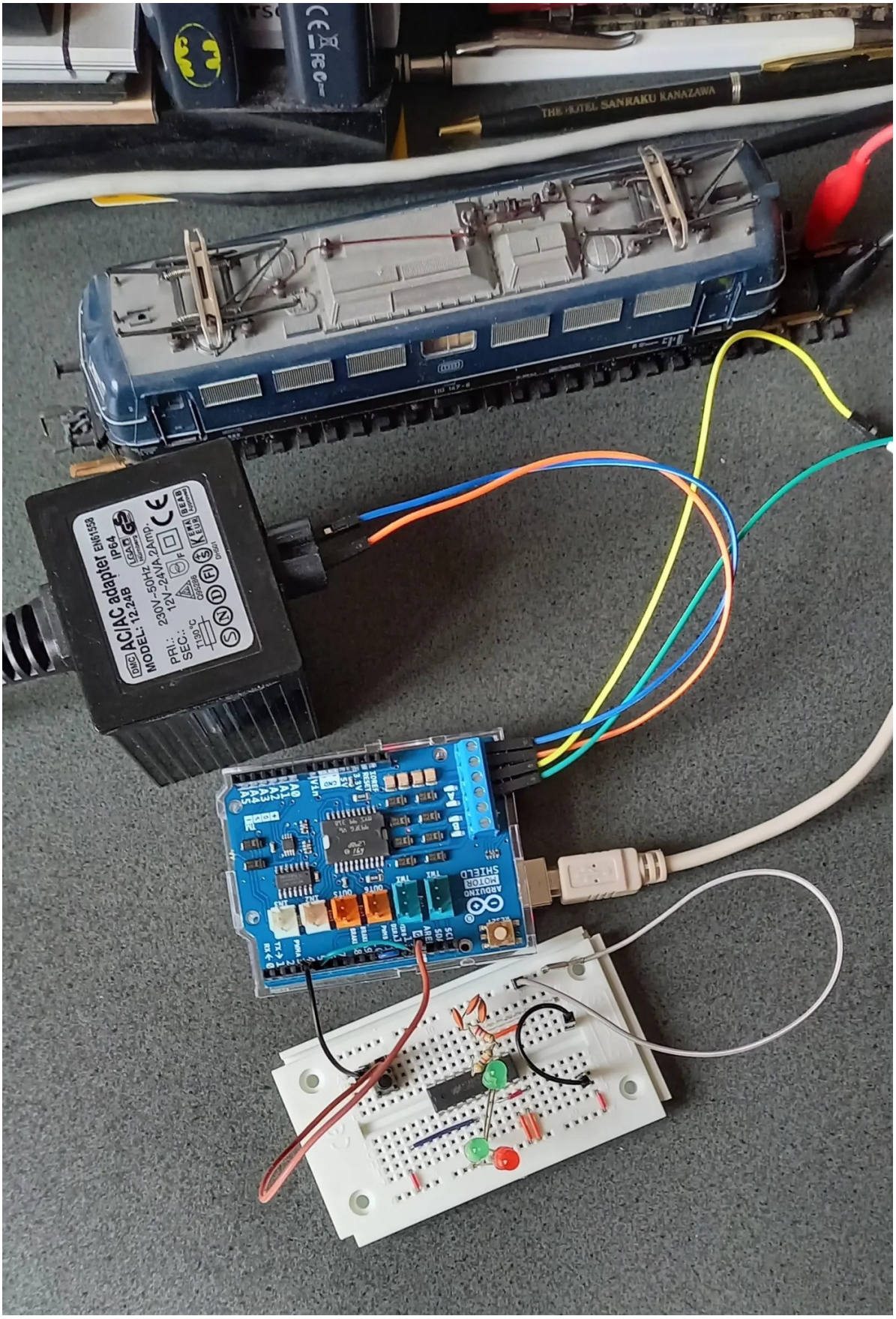
https://www.locoduino.org/local/cache-vignettes/L700xH525/schema_7-fdb6b.png?1724573077

Environment and Script

The five messages in the example are:

- One IDLE message;
- Two speed commands;
- Two light commands.

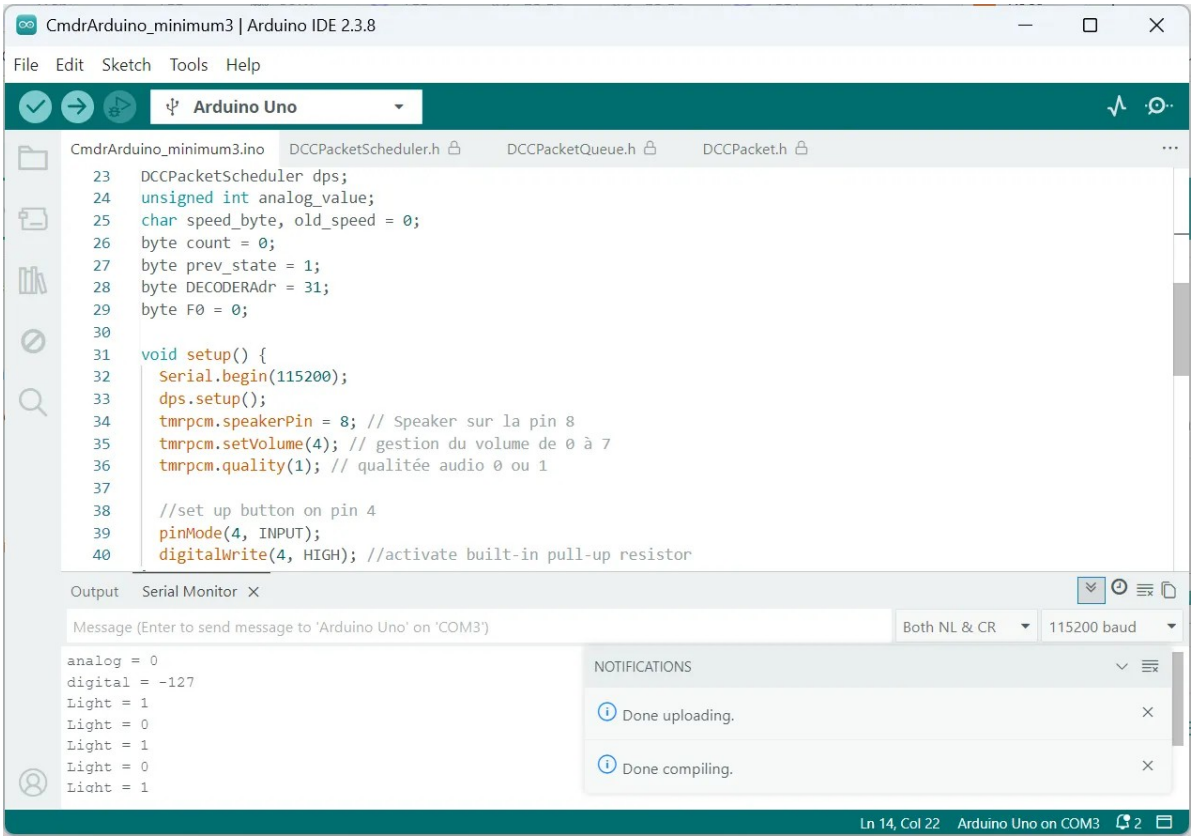
This allows you to control up to two locomotives.



Configuration: DC GS, Decoder: ESU., Adresse: 31, DNC Adapter to Motor Shield on Arduino Uno

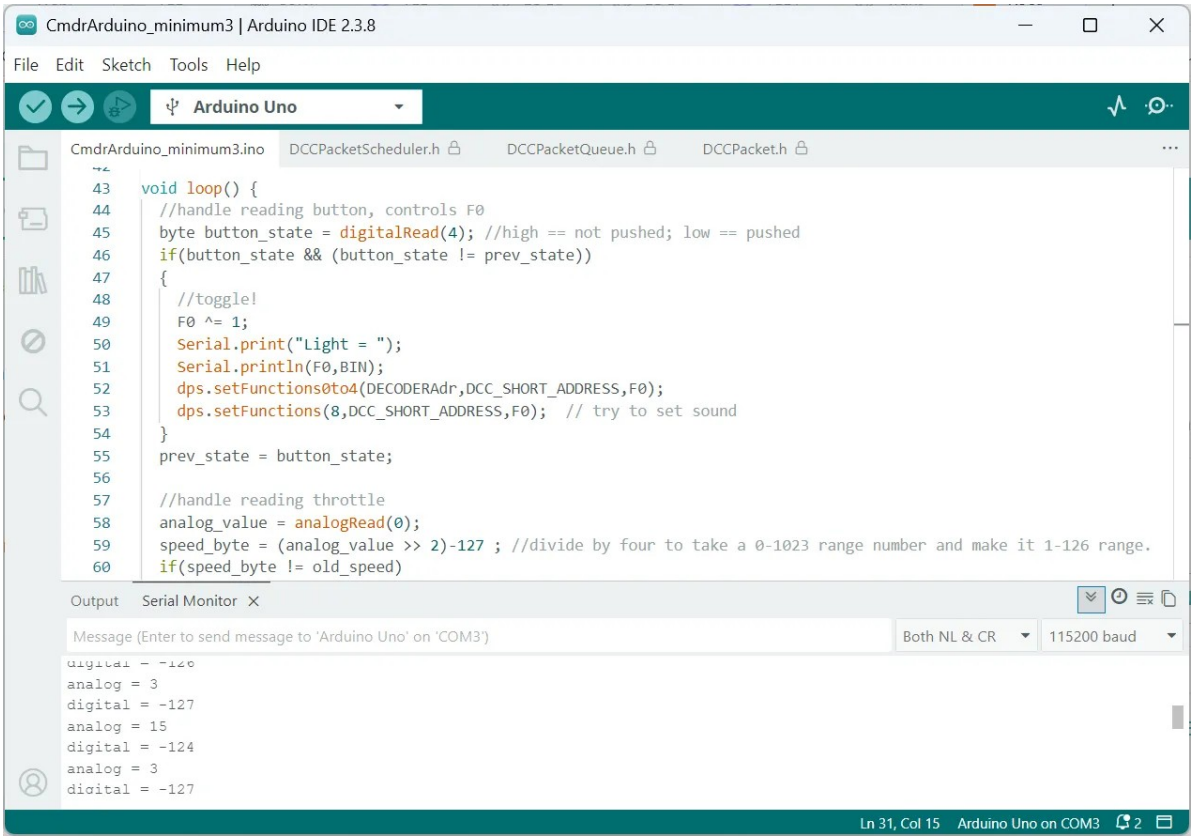
This method has the advantage of being quite simple, but it has the disadvantage of requiring bit-by-bit knowledge of the DCC commands. Therefore we use

You'll notice that the wiring is significantly simplified. On the motor shield, you need to connect pin 5 to pin 13 (green cable above) and pin 10 to pin 12 (short blue cable) in the **Configuration**. Note that all pins in the **Schema** above outlined in red or filled with red are reserved for DCC++ and should not be used. All pins outlined in green are available, as well as the ground (GND) and the +5V and +3.3V power outputs.



https://sourceforge.net/projects/maxbox5/files/examples/1482_CmdrArduino_minimum3Copy.ino/download

The brown and black cable from the shield to the breadboard are just for the button to toogle the light on the locomotive On and Off. For the moment theres no potentiometer to handle the speed cause the railtracks are too short ;). The rest on the breadboard like LED's and IC is just for testing some sound but not yet finished.



Some tests with speed control in the main loop

Conclusion

You now have several proven hardware configurations and the means to implement them to use DCC++ on your layouts.

The Arduino Motor Shield is an economical and fairly simple solution to set up. It includes built-in overvoltage, short-circuit, and over-temperature detection. It has one output for the main track and one for the programming track and you need the following materials.

- Arduino board (duemilanove328 or UNO R3 or compatible one, for example Arduino UNO R3, Akiduki's AT-MEGA board)
- MC33926 Motor Driver Shield (based on **L298 dual full-bridge driver**)
- Breadboard for buttons, leds or potentiometers
- USB cable (suitable with your arduino board)
- Windows 10 or 11 PC. Please install .NET Framework 4.0 runtime package before if not installed.
- Single Rail Tracks for N or H0
- Power supply for 12 – 18V DC up to 3 amps (36VA if 12V).
- Track cable and power supply cable for programming or main tracks

CmdrArduino is an embedded library written in C++ that provides the foundation for

implementing an NMRA DCC command station. CmdrArduino presents classes and methods for, among other things, setting a locomotive's speed, activating functions, switching turnouts, and programming DCC decoders.

The LokPilot 5 from ESU DCC is a dedicated DCC decoder. 14 to 128 speed steps are standard, as are 2- and 4-digit addresses. Up to 32 functions can be triggered. Thanks to RailComPlus®, the decoders register fully automatically with a compatible digital command station.

4 Nation Locs: SNCF, DB, SBB, FS

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Location

123 Example Street
Bern San Francisco, CA 12345