Power shield that can drive: relays, solenoids, DC and stepper motors

**Features**
- For use with Arduino Due™, Arduino Uno™, Arduino Mega™
- Based on L298P dual full bridge driver IC
- Outputs: up to 2 DC motors or 1 bipolar stepper motor
- Power supply: external power or power from Arduino board

**Specifications**
- Power supply: 7..46VDC
- Max current: 2A
- Dimensions: 68 x 53mm / 2.67 x 2.08"
Velleman N.V.
Legen Heirweg 33
9890 Gavere
(België)
1. Assembly  (Skipping this can lead to troubles !)

Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

1.1 Make sure you have the right tools:
- A good quality soldering iron (25-40W) with a small tip.
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.
- Thin raisin-core solder. Do not use any flux or grease.
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes.
- Needle nose pliers, for bending leads, or to hold components in place.
- Small blade and Phillips screwdrivers. A basic range is fine.

◊ For some projects, a basic multi-meter is required, or might be handy

1.2 Assembly Hints:
- Make sure the skill level matches your experience, to avoid disappointments.
- Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- Perform the assembly in the correct order as stated in this manual.
- Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
- Values on the circuit diagram are subject to changes, the values in this assembly guide are correct*
- Use the check-boxes to mark your progress.
- Please read the included information on safety and customer service

* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

1.3 Soldering Hints:

1. Mount the component against the PCB surface and carefully solder the leads

2. Make sure the solder joints are cone-shaped and shiny

3. Trim excess leads as close as possible to the solder joint
DO NOT BLINDLY FOLLOW THE ORDER OF THE COMPONENTS ONTO THE TAPE. ALWAYS CHECK THEIR VALUE ON THE PARTS LIST!

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REMOVE THEM FROM THE TAPE ONE AT A TIME!
1 Resistors

- R1: 4K7 (4 - 7 - 2 - B)
- R2: 10K (1 - 0 - 3 - B)
- R3: 4K7 (4 - 7 - 2 - B)
- R4: 4K7 (4 - 7 - 2 - B)
- R5: 10K (1 - 0 - 3 - B)
- R6: 4K7 (4 - 7 - 2 - B)
- R7: 1K (1 - 0 - 2 - B)
- R8: 1K (1 - 0 - 2 - B)
- R9: 100K (1 - 0 - 4 - B)
- R10: 10K (1 - 0 - 3 - B)

2 Ceramic capacitors

- C1: 100nF (104)

3 Shotky diode

- D1: 1N5819
- D2: 1N5819
- D3: 1N5819
- D4: 1N5819
- D5: 1N5819
- D6: 1N5819
- D7: 1N5819
- D8: 1N5819

4 Transistors

- T1: BC547B
- T2: BC547B

5 Male header

- SK8... SK10: 2x3pin

External power (max 50V)

Internal power from Arduino Max. 2A
6 Female header
- 2 x 6p
- 2 x 8p

7 LED’s
- LD1
- LD2

8 Terminal blocks
- SK5: 2p (motor 1)
- SK6: 2p (motor 2)
- SK12: 2p (power supply)

9 Electrolytic capacitors
- C3: 22µF
- C2: 100µF

10 Dual Full Bridge driver
- IC1: L298P

- Watch the polarity!
- Watch the position of the notch!

- Do not cut the connector pins!
- Solder each connection

- Solder
DOWNLOAD SAMPLE CODE FROM KA03 PAGE ON WWW.VELLEMAN.BE
**Leds and how to use them**

Leds feature a specific voltage drop, depending on type and colour. Check the datasheet for exact voltage drop and rated current!

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**How to Calculate the series resistor:**

Example: operate a red led (1.7V) on a 9Vdc source. Required led current for full brightness: 5mA (this can be found in the datasheet of the led)

\[
\text{Supply voltage (V) - led voltage (V)} = \text{series resistance (ohms)}
\]

\[
\frac{9V - 1.7V}{0.005A} = 1460 \text{ ohm}
\]

Required resistor power handling = voltage over resistor x current passed trough resistor

\[
(9V - 1.7V) \times 0.005A = 0.036W
\]

Closest value: use a 1k5 resistor

LEDs in series:

Example: 3 x red led (1.7V) on 9V battery

Required led current for full brightness: 5mA

(this can be found in the datasheet of the led)

\[
\frac{9V - (3 \times 1.7V)}{0.005A} = 780 \text{ ohm}
\]

Use an 820 ohm resistor

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**open collector outputs**

An open collector output can be compared to a switch which switches to ground when operated

Example: How to switch an LED by means of an open collector output

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Never connect leds in parallel

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