

# ULN 2xxx

## Motor driver in your hand.

### The most popular logic families in one place.

#### Motors

##### 2x Stepper Motor Driver

- Stepper motor #1**
- Green 4x LED matrix - channel diagnostic/testing
  - 2x Screw terminal connector, ULN2xxx - DC motor connection
  - JMP(1-4) - LED / Screw terminal connector

- Stepper motor #2**
- Yellow 4x LED matrix - channel diagnostic/testing
  - 2x Screw terminal connector, ULN2xxx - DC motor connection
  - JMP(5-8) - LED / Screw terminal connector

##### 4x H-Bridge

- Standard DC motor support
- Protoboard with additional resistors supports 4x H-Bridge channels
- DC motor controller: directions and speed regulation
- Pulse-width modulation supported

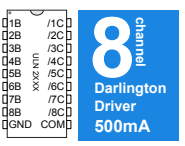
#### Electromechanical components

- Printed circuit board (PCB) 90mm x 90mm
- ULN2xxx (ULN2803/ULN2003 - TTL/5V CMOS)
- 1x DIP/DIL 18 socket
- 5x Screw connector (two terminals)
- 2x pin head male (one package 40 pins)
- 20x jumpers
- 8x resistor 150Ω 0.5W
- 8x LED 20mA, 2.3V, green
- 8x LED 20mA, 2.3V, yellow

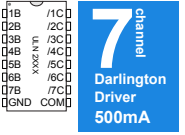
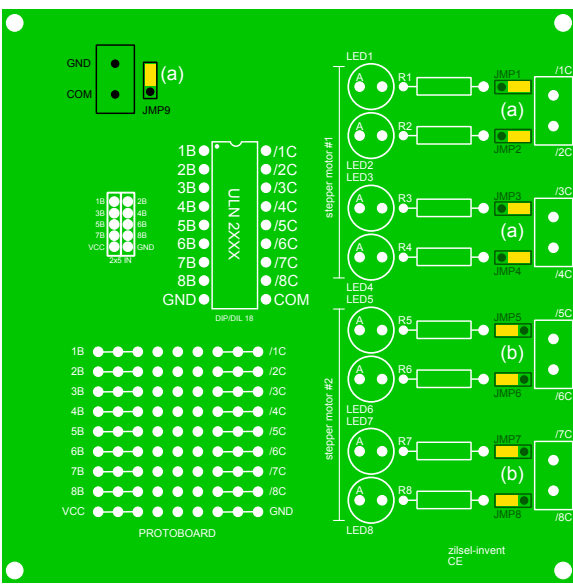
**Remark:** all values are related to TTL / 5V CMOS family.

#### Applications

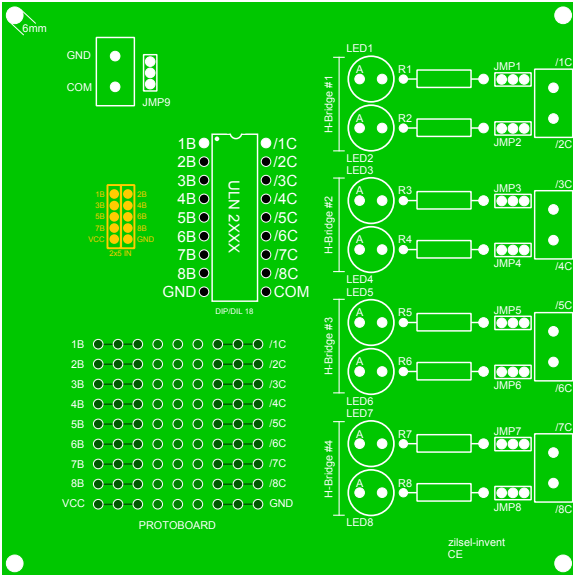
Embedded robotics, motor control, education, LED drivers, Seven-segment display drivers, relay drivers.



- ULN2801A
- ULN2802A
- ULN2803A
- ULN2804A
- ULN2805A



- ULN2002A
- ULN2003A
- ULN2004A

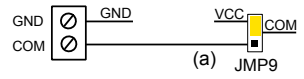


#### Compatibility BA12xxx series

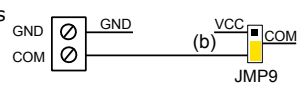
- BA12001
- BA12002
- BA12003
- BA12004

#### Back-EMF

Back-EMF controlled routing through jumper **JMP9** (left) setup.

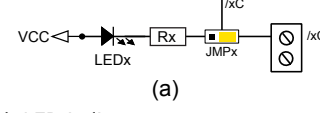


**JMP9** position (a), back EMF is routed to VCC reference point. **JMP9** position (b), back EMF is routed to COM reference point.

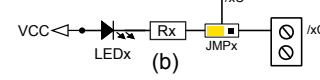


#### LED / Screw terminal connector jumpers

Save your workspace - with LED matrix development and control software testing is easier, DC motors are not required.



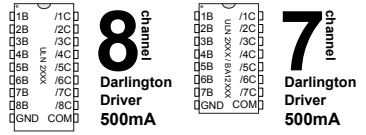
**JMPx** position (b), connects ULN2xxx xC pin with LED indicator. In this case screw connector is inactive as well as DC motor. This configuration is ideal for development and testing.



x = 1, ... , 8 (JMP1, ... , JMP8, LED1, ... , LED8, R1, ... , R8, /1C, ... , /8C)

#### ULN2xxx / BA12xxx seven channels supported

IC pins related to seven channel drivers are marked with **black dots**. 1B i /1C pins are excluded (left).



#### Protoboard

Matrix dimension 9x9 solder points, 2.54mm, soldering on the back side. For each input / output channel ULN2xxx, **three solder points** connected in series, including **3x9** free solder points matrix(left).

Build your: H-Bridge, adapter connectors, additional LED matrices, keypads for manual motor control, pull up/down resistors, measurement device ground (GND) reference point ...

#### Mounting holes

Easy installation with 4x mounting holes, each 6 mm in diameter.

#### Connectors

Predefined connection with development system / microcontroller - **2x5 input pin head** connector - flat cable, 10 wires.

**Universal connection with development system / microcontroller** - Build your custom adapter connector with protoboard. Make your own connector.