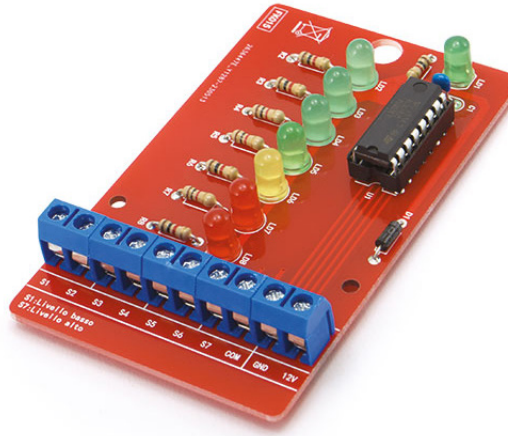
LIQUID LEVEL INDICATOR FOR TANKS *(cod. FK015)*



This liquid level indicator is a useful device for monitoring the liquid level inside tanks, reservoirs, and containers. It features seven electrodes that can be positioned inside the tank, and each electrode is associated with a corresponding LED that lights up when the liquid reaches the desired level.

The heart of the device is the ULN2003 integrated circuit, a versatile and robust line driver. Each electrode is connected to an input of the ULN2003 through a contact that remains isolated until it is touched or submerged in the liquid. When this happens, the liquid acts as resistance, allowing current to flow from the base of the corresponding Darlington pair inside the ULN2003. This switching activates the corresponding output and lights up the associated LED, indicating the level reached.

The liquid level indicator for tanks or containers can display up to seven LEDs lit simultaneously, corresponding to the liquid levels reached. The maximum level can be considered as a reference point for the tank's maximum capacity.

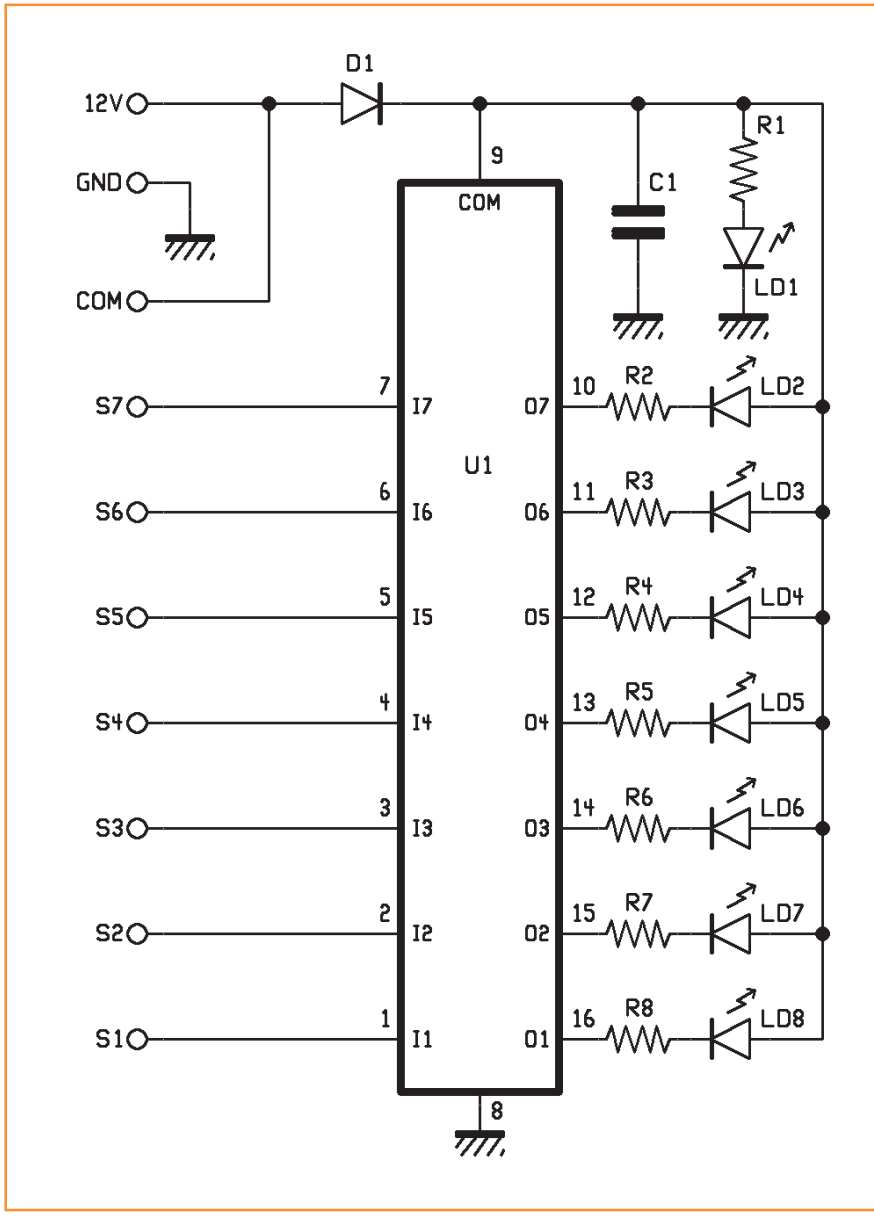
Implementation and Installation

All the required components are of traditional through-hole mounting type. Begin with the resistors and the silicon diode D1 (which should be oriented as shown in the assembly diagram visible on page 3), and continue with the socket for the integrated circuit (orient it as indicated, with the reference notch facing the input electrode connections). Complete the assembly by inserting and soldering capacitor C1, the

Technical Specifications

- **Power supply: 9÷14 Vcc**
- **Absorption (max): 200 mA**
- **Number of detectable levels: 7**
- **Dimensions: 50x84x22 mm**

Electrical diagram



[Assemby PLAN]

Component list:

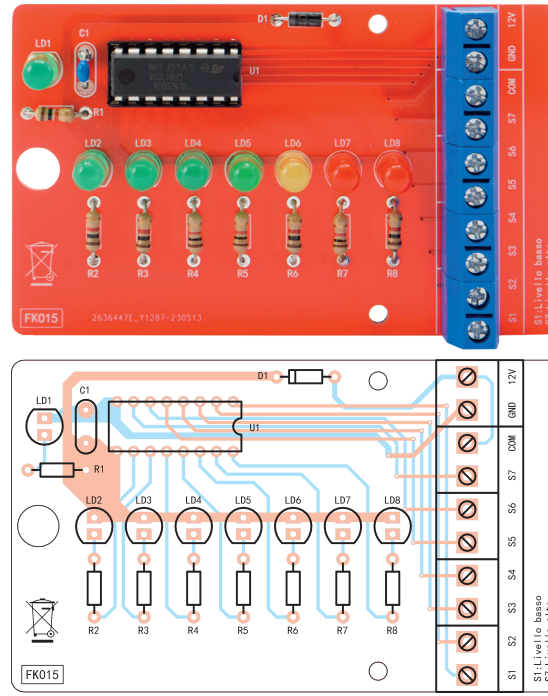
R1, R2, R3, R4, R5, R6, R7, R8: 1 kohm

C1: 100 nF ceramic
U1: ULN2003
LD1, LD2, LD3, LD4, LD5: LED 5 mm green

LD6: LED 5 mm yellow
LD7, LD8: LED 5 mm red
D1: 1N4007

Various:

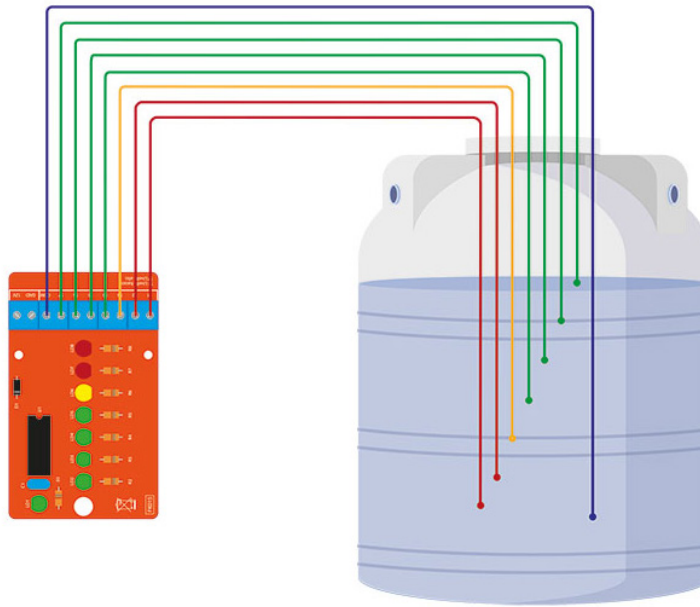
- Socket 8+8
- 2-way clamp step 5.08 mm (5 pz.)
- Circuito stampato FK015 (51x85 mm)



LEDs (for which it should be noted that the cathode is the electrode located on the beveled side of the package), and the 5 mm pitch terminal blocks for power connections (12V and GND) and the seven inputs (S1÷S7) plus common (COM). You will need a total of five bipolar terminal blocks. The last component to be mounted is the ULN2003, which should be inserted into the designated socket, remembering to orient it with the reference facing the terminal blocks. Once this is done, the circuit is ready for installation, requiring no preliminary calibration or adjustment. It should be wired, connected to the electrodes, and powered with a continuous voltage source with a value of 12-14V, capable of delivering at least 200 milliamperes.

Moving on to the installation: the electrodes to be placed in the liquid container should preferably be equidistant or, at the very least, it is useful to mark the volume corresponding to the distance between each electrode. For example, if the tank can hold liquid up to a height of 1 meter at the point we consider the maximum level, you can place the 7 electrodes equidistantly by dividing the meter by 7 and then placing the electrodes starting from 1/7 and going upwards. So, the first one from the bottom (let's assume S1) at 14.28 cm, the second

Wiring Diagram



one (S2) at 28.56 cm, the third one at 42.8 cm, the fourth one at about 57 cm, the fifth one at 71.4 cm, the sixth one at 85.7 cm, and the last one (S7) at exactly 1 meter. With this arrangement, at the level of 14.28 cm, LD8 will light up, at 28.56 cm both LD8 and LD7 will light up, and so on, until all the LEDs controlled by the ULN2003 are illuminated when reaching or exceeding the meter in height.

You can also place the minimum electrode just at the bottom of the container, if the structure allows it, but in this case, the common electrode must also be placed at the bottom of the tank. To avoid drilling the tank or container, it is advisable for the electrodes to be mounted immersed from the inside, close to a wall. However, the connections should be well insulated up to the point of electrode placement; ideally, introduce and secure a sealed plastic tube containing the connecting wires into the tank and have a metal bushing or stainless steel screw exit from it at the desired electrode height."

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