

SMART FLUID LEVEL INDICATOR

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Most of the fluid level indicator circuits use a bar graph or a seven-segment display to indicate the fluid level. Such a display using LEDs or digits may not make much sense to an ordinary person. The circuit presented here overcomes this flaw and displays the level using a seven-segment display—but with a difference. It shows each level in meaningful English letters. It displays the letter E for empty, L for low, H for half, A for above average, and F for full tank.

The circuit is built using CMOS ICs. CD4001 is a quad. NOR gate and CD4055 is a BCD to seven-segment decoder and display

driver IC. This decoder IC is capable of producing some English alphabets besides the usual digits 0 through 9. The BCD codes for various displays are given in Table I. The BCD codes are generated by NOR gates because of their interconnections as the sensing probes get immersed in water. Their operation being self-explanatory is not included here.

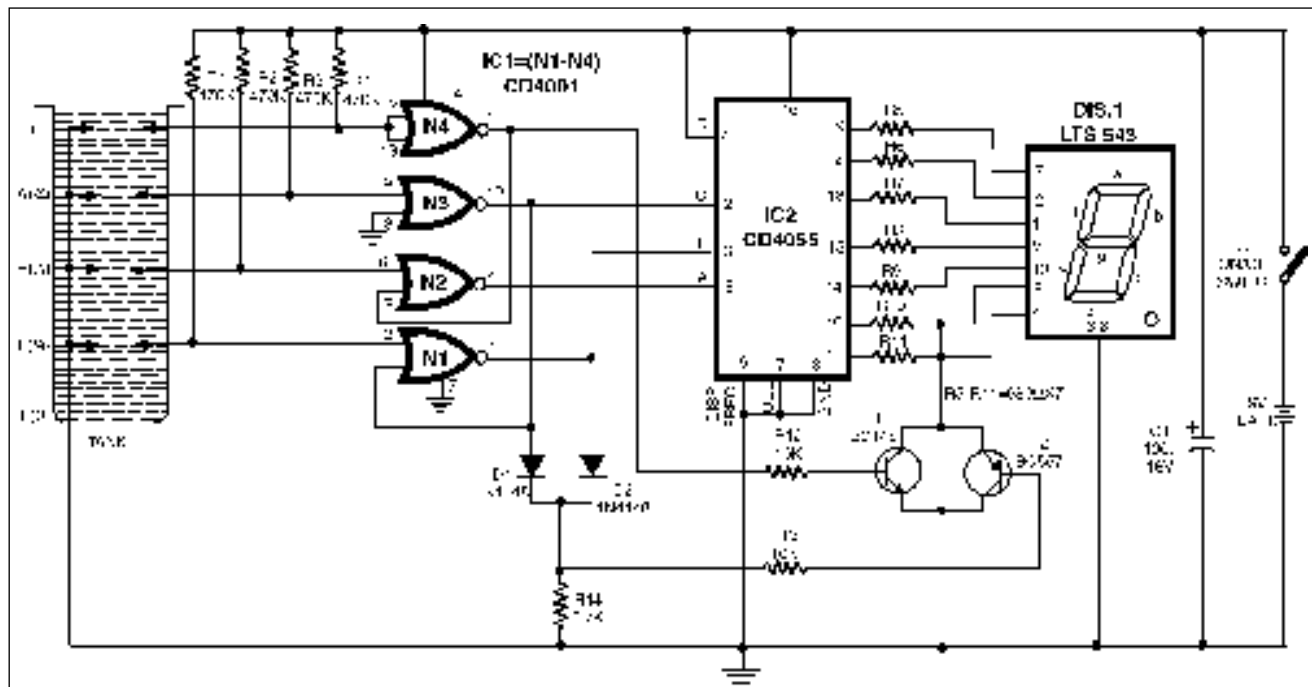
Note that there is no display pattern like E or F available from the IC. Therefore to obtain the pattern for letters E and F, transistors T1 and T2 are used. These transistors blank out the unnecessary segments from the seven-segment display. It can be seen that

letter E is generated by blanking 'b' and 'c' segments of the seven-segment display while it decodes digit 8. Letter F is obtained by blanking segment 'b' while it decodes letter P.

As CMOS ICs are used, the current

TABLE I

D	C	B	A	DISPLAY
L	L	L	L	0
L	L	L	H	1
—	—	—	—	2
—	—	—	—	3
—	—	—	—	4
—	—	—	—	5
—	—	—	—	6
—	—	—	—	7
H	L	L	L	8
H	L	L	H	9
H	L	H	L	L
H	L	H	H	H
H	H	L	L	P
H	H	L	H	A
H	H	H	L	—
H	H	H	H	BLANK



consumption is extremely low. This makes it possible to power the circuit from a battery. The input sensing current through the fluid (with all the four

probes immersed in water) is of the order of 70 μ A, which results in low rate of probe deterioration due to oxidation as also low levels of electrolysis in the

fluid.

Note: This circuit should not be used with inflammable or highly reactive fluids.