Versatile Object Counter

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Object counters are extensively used in industries. Normally, these are made of expensive microcontrollers or processors. For costly microcontroller. The circuit is good for those who are not familiar with programming of microcontrollers. Moreover, there is the flexibility of the IR beam. This pulls the base of npn transistor BC547 (T2) high, driving the transistor into saturation and pulling the trigger pin (pin 2) of NE555 timer low.

Fig. 1: Object counter circuit

The NE555 timer (IC1) is configured as a monostable multivibrator that generates a pulse of 330ms duration. This monostable output is given as clock to dual up-counter CD4518 (IC2). IC2 increments on every positive edge of the clock, giving a BCD output on pins 3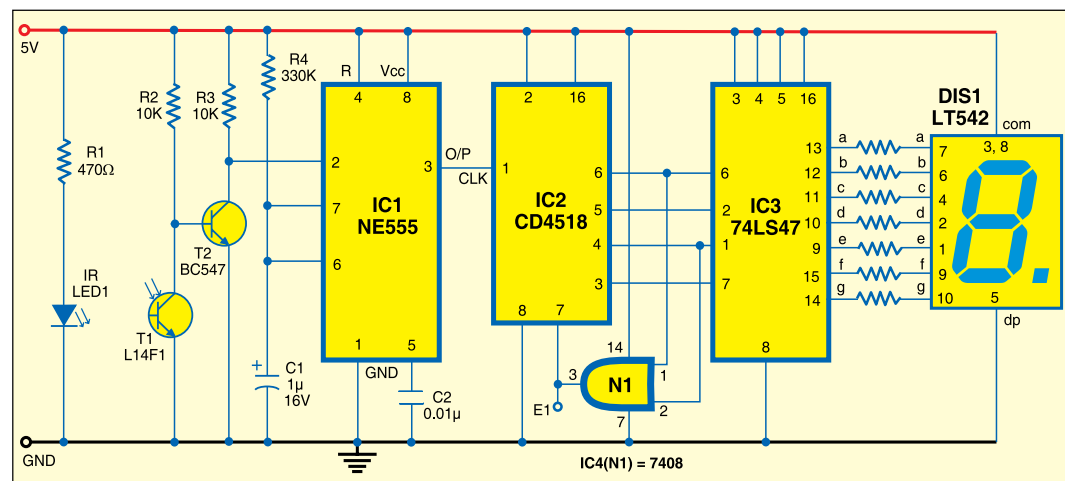 to 6. The purpose of NE555 timer is to prevent signal debouncing from transistor T2. NE555 timer gives a perfect clock pulse.

Fig. 2: Expansion circuit

increasing the count using a small expansion circuit.

The object counter circuit is shown in Fig. 1 and the expansion circuit in Fig. 2. For instance, to count the objects IR transmitter (IR LED1) is placed on one side of the conveyor belt on which objects move. On the other side is a phototransistor L14F1 (T1) that senses the transmitted IR beam. When an object passes between the transmitter and receiver, it obstructs

When the BCD count reaches 9, IC2 is reset by AND gate N1 (IC4), simultaneously sending a clock signal to counter CD4518 (IC5) of the expansion circuit (if used). This BCD value is given to seven-segment display driver 74LS47 (IC3), which displays the number on seven-segment display DIS1. The count can be easily increased by connecting E1 pin from IC4 in Fig. 1 to E1 pin of the expansion circuit in Fig. 2. The E2 pin in Fig. 2 can be used to clock another similar expansion circuit. This way the objects' count can be increased as desired by simply adding an expansion circuit. ●
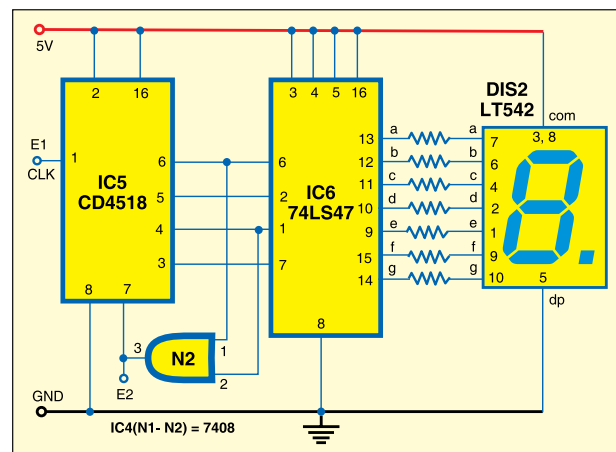
small-scale industries, this means a lot of cost. Here is a simple circuit that can count objects without using any