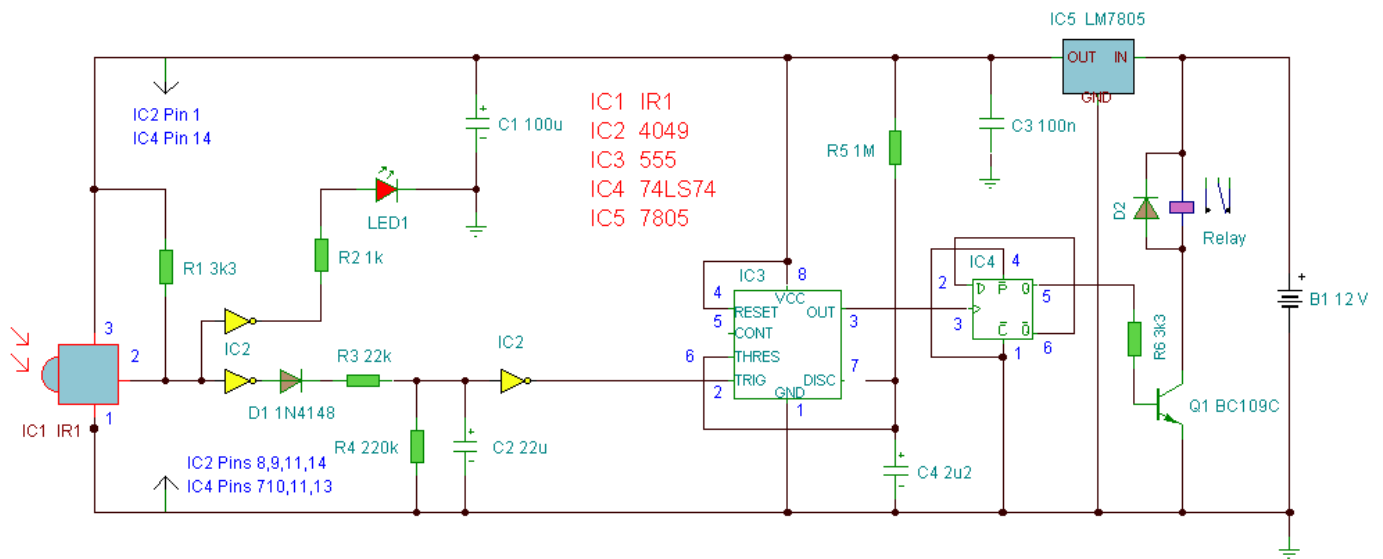




Infra Red Switch

Description:

This is a single channel (on / off) universal switch that may be used with any Infra Red remote control that uses wavelengths between 800-900 nm.



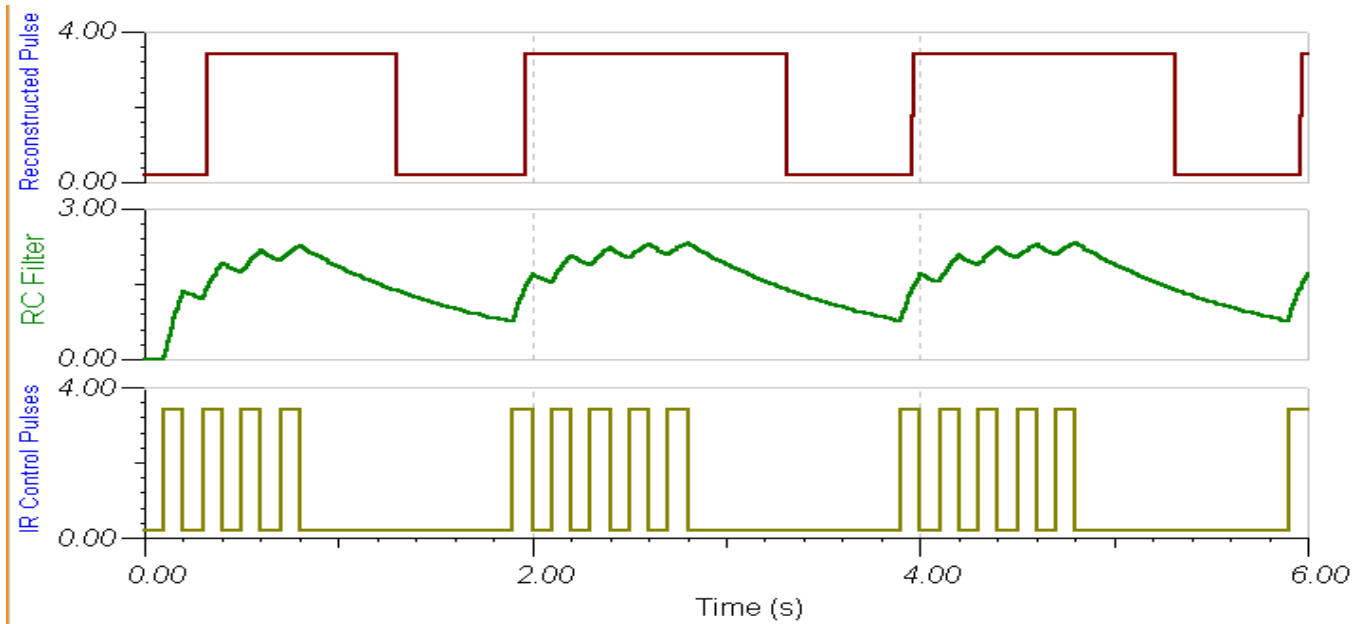
Notes:

Any "button" of any remote control may be used to work this universal switch. The button must be pressed for two seconds (determined by R_T and C_T) before the relay will operate. Once operated the circuit will remain in this state (latched) until reset. To reset, any button is pressed and held for the delay.

For example, if you were watching TV, and your set was tuned to Channel 7, you could press and hold the TV remote controls channel 7 button for two seconds. That way the TV viewing would not be affected and the relay would activate. You can connect anything to the relay, for example a lamp, but make sure that the relay contacts can handle the rated voltage and current.

Circuit Operation:

IC1 is an Infra Red module. IR modulated pulses are received and buffered by this IC. It has a standard TTL output, the output with no signal is logic 1. One gate of a CMOS inverter and drives Red LED1 as a visible switching aid. Another gate buffers the signal and applies it to the time constant circuit, comprising R_T , C_T , R_Σ and D_1 . C_T charges via R_T , and discharges via R_Σ , D_1 prevents quick discharge via the low output impedance of the CMOS buffer.



The pulses are further buffered and contain "jagged edges" as shown above. These edges are produced by the modulated IR data, which has to be removed. This is achieved using IC₂, a 555 timer wired as a monostable, pulse duration R_0, C_2 . These cleanly reconstructs a single clean pulse to activate the bistable latch. A D type flip flop, IC₃ is configured as a bistable. The input is applied to the clock pin, the inverted output fed back to the data input and clear and preset lines are tied to ground. For every pulse the relay will operate and latch, the next pulse will turn off the relay and so on. Note that quick turn on and off of the relay is not possible. The output pulse is set at about 1,0 seconds and input delay by R_2, C_2 set at two seconds.

Parts List:

- R₁ 2k Ω
- R₂ 1k
- R₃ 22k
- R₄ 220k
- R₀ 1M
- R₆ 2k Ω
- B₁ 12V
- D₁ 1N4148
- D₂ 1N4002
- Q₁ B109
- LED₁ CQX20A
- IC₁ IR₁ available from Harrison Electronics
- IC₂ 555
- IC₃ CA000
- IC₄ SNV4HCTV4
- IC₀ LMV405
- Relay 12 Volt coil with changeover contact
- C₁ 100 μ
- C₂ 22 μ
- C₃ 100n
- C₄ 2 μ

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