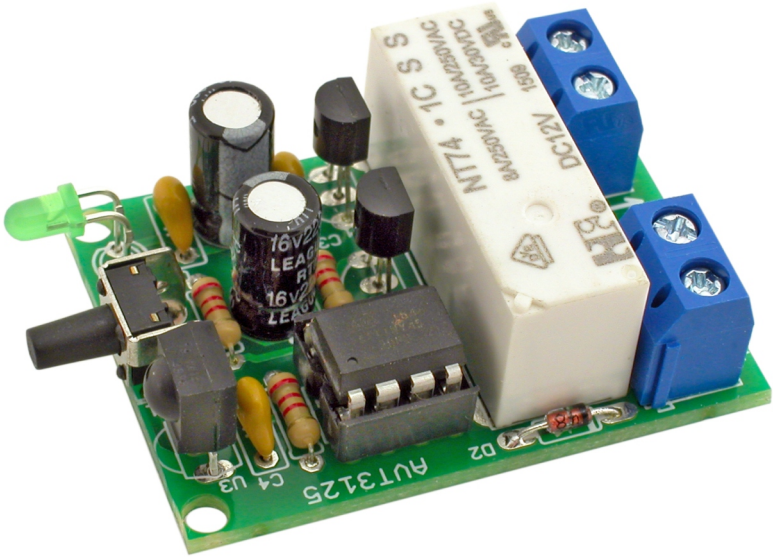
AVT 3125
Remote switch controlled by any infrared remote control



A simple remote control switch, that works with any infrared remote control. It has one output with an 8-amp relay. The device is powered from 12V power supply. It can directly supply any 12V LED diode or bulb.

Specifications

- enables and disables 12V devices
- works with any infrared remote control unit
- intuitive, simple and easy teach-in procedure
- possibility of selecting relay state after switching power on
- status LED
- 8-amp output relay
- power supply: 12V DC

Functional description

The schematic of the remote controlled switch is shown in Figure 1. The device should be powered from any 12V external power supply with power capacity corresponding to attached load. Input voltage is applied to voltage stabilizer 7805 (U1). The IR receiver is a TSOP4836 integrated circuit. The switch functionality is implemented by the Attiny45 microcontroller. The main task of the microcontroller is to receive the signal from the IR receiver and to analyze the codes sent from the IR transmitter. The output is powered by a relay with a load capacity 8A/230V AC.
The function of the IR receiver is the U3 type TSOP4836, and the whole operation of the switch is controlled by the Attiny45 microcontroller. The main task that the microcontroller performs, and actually its program, is receiving the signal from the IR receiver and analyzing the codes sent from the IR remote.
For a heavy load control, pay attention to the PCB paths. In order to increase the load capacity, it is possible to place the copper wire on the tracks and solder it.
The switch has a button which, in addition to entering into the programming mode, allows to switch on and turn off the output without the need for a remote control. Briefly pressing the button allows to change the state of the output relay. The LED1 indicates the current state of the relay, informs of the operation of the device, the command received from the remote control and entering the programming mode.

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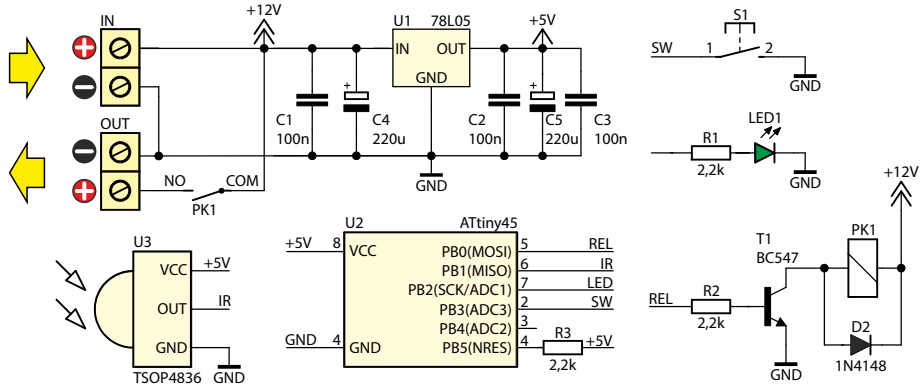

Figure 1. Schematic diagram

Assembly and test

Assembly of the device starts with resistors and other small-sized components, and ends with the installation of electrolytic capacitors, relay and screw terminals. The remote controlled switch assembled from the tested components does not require any adjustment and after registering the commands sent by the IR remote is ready for operation.

It is possible to program a separate command to enable the relay and separate to disable it. Entering the programming mode is done by pressing and holding the S1 key for about 5 seconds. After this operation, the LED will blink. This means that the device is waiting to acknowledge the command received from the IR remote. To confirm the command, press the same button on the remote control again. Longer holding of the S1 key completes the command learning process. The unit will react only to one button on the remote, which is alternately switching on and turning off the output relay. If you want to program separate buttons to switch on and turn off the relay, do not exit the programing mode, but as before, enter the command to turn off the relay twice. Before leaving the programming mode must be determined the state of the relay after the power on. In programming mode, every short press of S1 changes the state of the relay to the opposite. If you leave the programming mode with the relay switched on, the relay will always be on when the power is turned on. Leaving learning mode with the relay turned off will cause the relay to turn off when power is turned on. The programming mode is terminated by pressing and holding S1 button for a few seconds. Entering the programming mode is possible at any time during operation of the device.

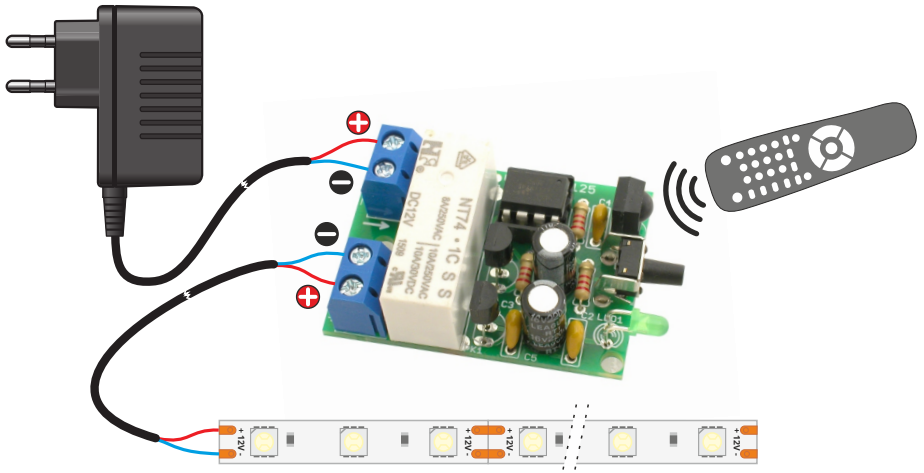

Figure 2. Connection example

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Component list

Resistors:
R1-R3: .....2,2kΩ (red-red-red-gold)
Capacitors:
C2-C4: .....100nF (also marked as 0.1 or 104)
C5, C6: .....220µF !
Semiconductors:
D2: .....1N4148 !
LED1: .....LED diode !
U1: 78L05
U2: .....ATtiny45 with 8-pin IC socket
U3: .....TSOP4836 !
T1: .....BC547 (BC548) !
Others:
S1: .....switch
PK1: .....relay
IN: .....2-pin terminal block connector
OUT: .....2-pin terminal block connector

While assembling the components marked with an exclamation mark attention should be paid to their polarity. Symbols of the components on the PCB as well as photos of assembled sets may come in useful. To access high-resolution images, download the PDF file.

http://bit.ly/2Mse0iR
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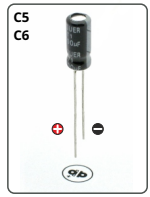
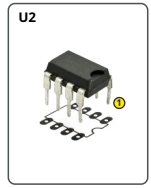
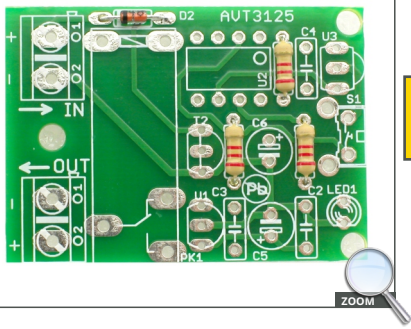




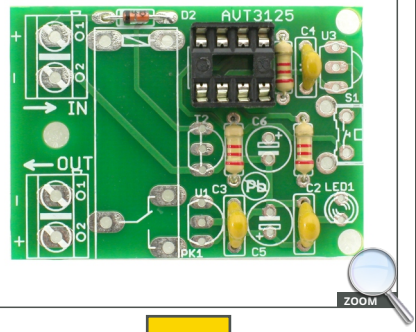
Start off by soldering the printed circuit elements in order from smallest to largest. The unit assembled flawlessly, using the supplied components will operate immediately after switching on the power supply.

Assembly in 4 steps

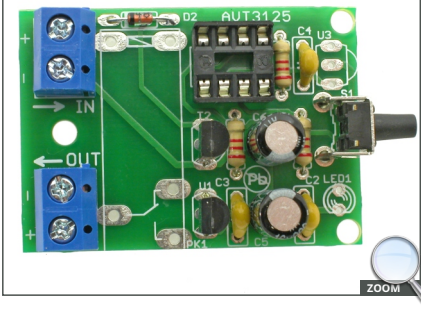
1 Solder resistors R1-R3 and diode D2



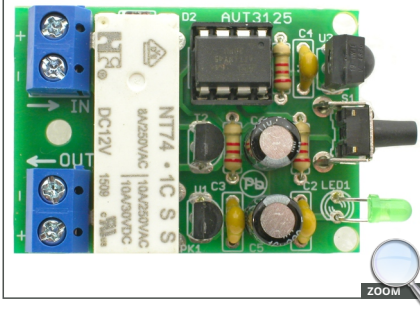
2 Solder capacitors C2-C4 and IC socket



3 Solder voltage stabilizer U1, transistor T2, capacitors C5, C6, switch and connector.



4 Solder infrared receiver U3, capacitors C5, C6, LED1, and relay, insert chip into socket.



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Notes

Thank you for purchasing AVT product. Please take your time to read carefully the important information below concering use of this product.

Educational Electronics Kits are intended for educational and demonstration purposes only. They are not intended for use in commercial applications. If they are used in such applications the purchaser assumes all responsibility for ensuring compliance with all local laws. In addition, they cannot be used as a part of life support systems, or systems that for use as or as a part of life support systems, or systems that might create a hazardous situation of any kind.

• Battery or wall-adaptor are safe devices. They do not require special attention unless main voltage is connected to an output e.g. a relay.
• If the kit is used to switch currents greater than 24V it is necessary to have the installation and performed by a trained professional authorized for such work. The kit may only be used in such application if it was installed in a safe to touch enclosure.
• Never exceed the limits or ratings listed in the 'Specifications' section at the this user guide.
• If the kit is used in schools or educational facilities or similar institutions the operation must be supervised by trained and authorized staff.
• The product itself and all parts thereof (including packing material) are not suitable toys for childern! (choking hazard, risk of electric shock, ...)

Failures in modern electronic component are very rare as 95% of non-working kits are due to poor soldering or components placed in the wrong location or orientation so please check your work carefully.

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AVT SPV Sp. z o.o.

Leszczynowa 11 Street,
03-197 Warsaw, Poland
http://avtkits.com/

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