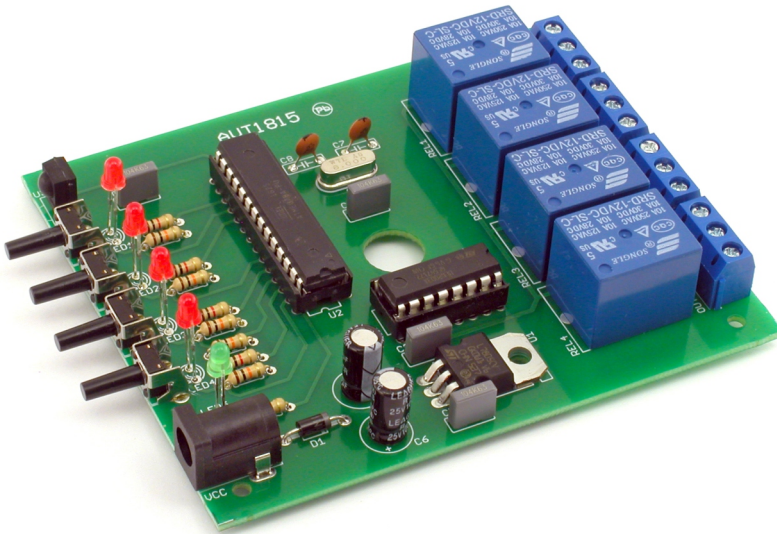


# AVT 1815

4-channel remote switch controlled by any infrared remote control



A simple remote controlled switch, that works with any infrared remote control. It has four relay outputs. Its advantage is possibility of being controlled with any remote control unit. Teach-in procedure is simple reduced to a few steps.

## Specifications

- Enables and disables 4 devices
- operated manually or via infrared remote control unit
- works with almost any IR remote
- very easy and intuitive teach-in procedure for learning the pilot codes
- power supply: 9-14V 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 ATmega 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 buffered by ULN2003A, which is powering output relays.

When switching on high power loads, attention should be paid to the load of the PCB tracks. To improve their load capacity, copper wire could be soldered. The switch has buttons for direct switching on and off of relays without the need for a remote control. Briefly pressing the button allows you to change the state of the relay. LED1...LED4 are indicating which relay is currently on. LED 5 informs of the operation of the device, receiving the command from the remote control and entering the programming mode.

4-channel remote switch controlled by any infrared remote control

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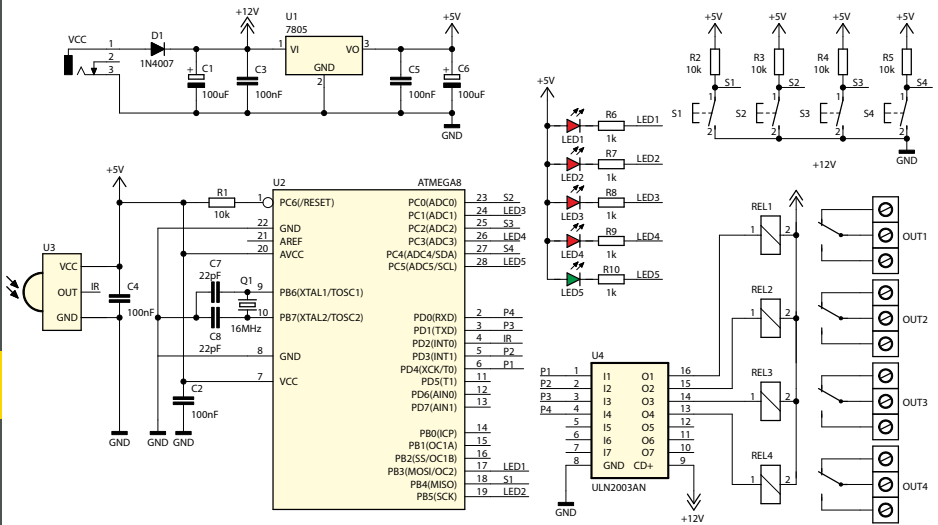


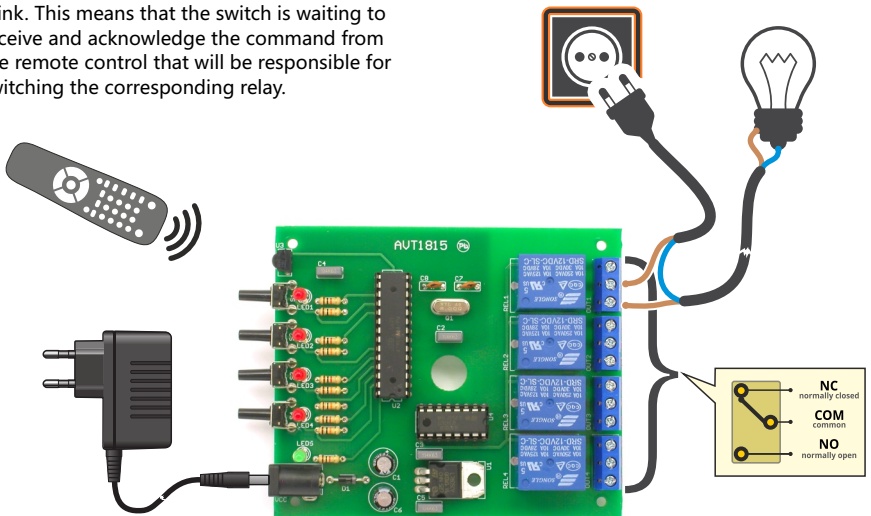
Figure 1. Schematic diagram

## Assembly and test

The assembly diagram is shown in Figure 2. The assembly starts from the soldering the resistors and other small components, and ending with the assembly of electrolytic capacitors, relays 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.

Entering the programming mode takes place after pressing the corresponding button for about 5 seconds. When it is done, the LED corresponding to the programmed channel will blink. This means that the switch is waiting to receive and acknowledge the command from the remote control that will be responsible for switching the corresponding relay.

Correct reception of the remote command will cause the LED to illuminate for a long time, after which the LED blinking will indicate that the switch is waiting for the confirmation of the registered command. To do this, press the same button again on the remote control. When the correct command is received, the programming procedure is completed and the switch returns to normal operation. Entering the programming mode is possible at any time during operation of the device and is carried out independently for each of the four channels.



# Component list

## Resistors:

R1-R5: .....10kΩ (brown-black-orange-gold)

R6-R10: .....1kΩ (brown-black-red-gold)

## Capacitors:

C1, C6: .....100μF !

C3-C5: .....100nF(also marked as 104)

C7, C8: .....22pF (also marked as 22)

## Semiconductors:

D1: .....1N4007 !

U1: .....7805 !

U2: .....ATmega8 with 28-pin IC socket

U3: .....TSOP4836

U4: .....ULN2003 with 20-pin IC socket

LED1-LED5: .....LED diode !

## Others:

Q1: .....8MHz

S1-S4: .....switch

VCC: .....power connector 2.1/5.5

REL1-REL4: .....relay

OUT1-OUT4: .....3-pin terminal block connector

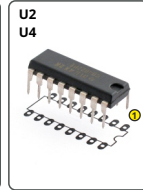
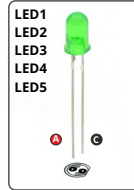
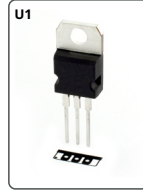
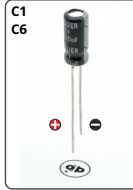


While assembling the components marked with an exclamation mark attention should be paid to their polarity. Symbols of the components on the PCB as well as photos of assembled sets may come in useful. To access high-resolution images, download the PDF file.

<http://bit.ly/2Khwa0A>

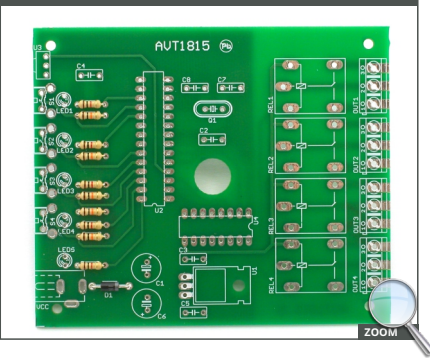


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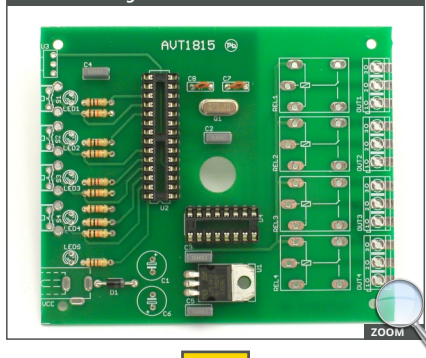


## Assembly in 4 steps

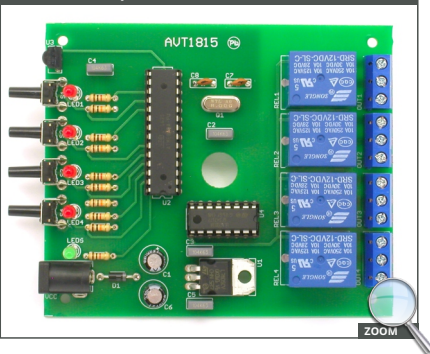
### 1 Solder resistors R1-R10 and diode D1



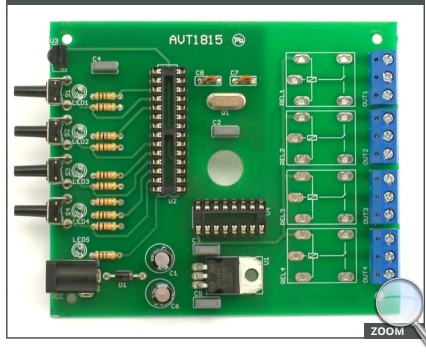
### 2 Solder IC socket, capacitors C2-C5, C7, C8, crystal and voltage stabilizer U1



### 4 Solder relays REL1-REL4, LED diodes LED1-LED5, insert chip into socket



### 3 Solder switch, connectors, capacitors C1, C6 and IR receiver U3



4-channel remote switch controlled by any infrared remote control

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Thank you for purchasing AVT product. Please take your time to read carefully the important information below concerning 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 children! (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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Assembly and connection of the device not in accordance with the instructions, unauthorized modification of components and any structural modifications may cause damage to the device and endanger the person using it. In this case, the manufacturer and its authorized representatives shall not be liable for any damages arising directly or indirectly from the use or malfunction of the product.