

AVT 1710 Adjustable delay switch



A simple device that can be used in applications, where it is necessary to delay the activation of any device. For example, it can be used in the car to delay the switching on lights. In this way, they will be switched on after the engine is started.

Specifications:

- delay time adjustable within 2-120 seconds
- output relay with contacts 230V AC, 8A
- power supply: 12-15V DC

Functional description

Schematics of adjustable delay switch is shown in Figure 1. Assembly diagram is shown in Figure 2. The device is based on the 4541 timer chip. It is configured to work as a timer with adjustable time delay. Resistors R1, R2, potentiometer PR1 and capacitor C3 are components of the internal oscillator of U1. They affect the length of the delay time. With the PR1 potentiometer, user can set a delay time of 2-120 seconds. The output Q of the integrated circuit U1 controls the transistor T1 that powers the output relay. The D2 is overvoltage protection diode. It protects the transistor against damage when the PK1 relay is switched off. The LED indicates that the relay is powered.



Figure 1. Schematic diagram

Assembly and test

Assembly is typical and should not cause problems. 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 device should be powered with 12-15V DC. For heavy load control, pay attention to the load on the relay contacts and the PCB tracks. Copper wire can be soldered to improve the load capacity of the PCB tracks.



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Component list

Resistors:

R1:1kΩ (brown-black-red-gold)													
R2: 100kΩ (brown-black-yellow-gold)													
R3, R4: 4,7kΩ (yellow-violet-orange-gold)													
PR1: trimmer potentiometer 100k Ω													
Capacitors:													
C1:100µF !													
2:100nF (also marked as 104)													
C4:150nF (also marked as 154)													
Semiconductors:													
U1:4541 IC with 14-pin IC socket													
D1, D2:1N4148 or similar !													
LED:LED diode													
T1:BC548 (BC547) !													
Others:													
PK1: relay													
IN, OUT: 2-pin terminal block connector													
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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 highresolution images, download the PDF file.







Adjustable delay switch



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



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LEVEL

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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This symbol means do not dispose of your product with your other household waste. Instead, you should protect human health and the environment by handing over your waste equipment to a designated collection point for the recycling of waste electrical tion and electronic equipment.

AVT SPV reserves the right to make changes without prior notice. 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.