AVT1996 Bedlight Night-Light Controller with Motion Detector User Guide

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A motion-sensing timer switch with flexible configurable operating parameters. It acts as an automatically switched night-light and is designed for use with LED strips. Detection of movement in a room with poor lighting conditions triggers a timer circuit, seamlessly brightening the LED light source attached to the output. After the time set by the potentiometer has elapsed, it is smoothly and slowly extinguished.

Specifications

- integrated motion and light sensor

- adjustable motion detector sensitivity

- adjustable operating time: 15 sec. – 8 min.

- maximum load: 12 V / 5 A (60 W)

- supply: 12 VDC

- small size: 33×66 mm

Circuit description

This controller is a perfect solution for the bedroom or children's room. The device together with an LED strip mounted under the bed (bedlight), will make it easier to get up at night and provide a sense of security. The lighting will be switched on when the user enters the room or when they touch the floor with their foot. The gently brightened light, which will not wake up the others, works well when the child gets up during the night or when we are to take care of them.

A schematic diagram of the controller is shown in Figure 1. The circuit described is switched on between the power source and the receiver. It must be supplied with DC voltage, this can be a battery or any power supply with a current capacity equivalent to the attached load. The D1 diode protects the circuit from being connected to a voltage with wrong polarity. The input voltage is applied to stabiliser IC1 type 78L05, while capacitors C1-C4 provide adequate filtering of this voltage. The operation of the circuit is controlled by an IC2 ATTINY25 microcontroller. Photoresistor PH1 acts as a twilight sensor, so that the light source connected to the output of the system will only be switched on in poor lighting conditions. A popular and inexpensive PIR detector of the HCSR501 type was used as the motion sensor. The sensor's range is a maximum of 7 m with a viewing angle of 100 degrees. A jumper located on the sensor allows you to change the way it reacts when motion is detected. Set in the "H" position, it keeps the detector output active as long as motion is detected. Whilst, the jumper in the "L" position configures the detector in such a way that once any motion is detected, the detector output remains activated for a preset time according to the potentiometer setting. Reactivation of the sensor is possible after approximately 3 seconds. The detector's operating range can be adjusted via a potentiometer, which is mounted closer to the configuration jumper, from approximately 3 to 7m. The second potentiometer adjusts the detector's activation duration when object movement is detected, between 5 and 200 seconds. Operation of the module starts as soon as the supply voltage is applied. The actuating element is a T1 transistor of type IRL3705. Lighting time of the light source connected to the output can be adjusted via potentiometer PR1 from approximately 15 seconds to approximately 8 minutes. Each time movement is detected, the time starts counting down from the beginning. Function of the motion detection indicator is performed by LED.

Figure 1. Schematic diagram
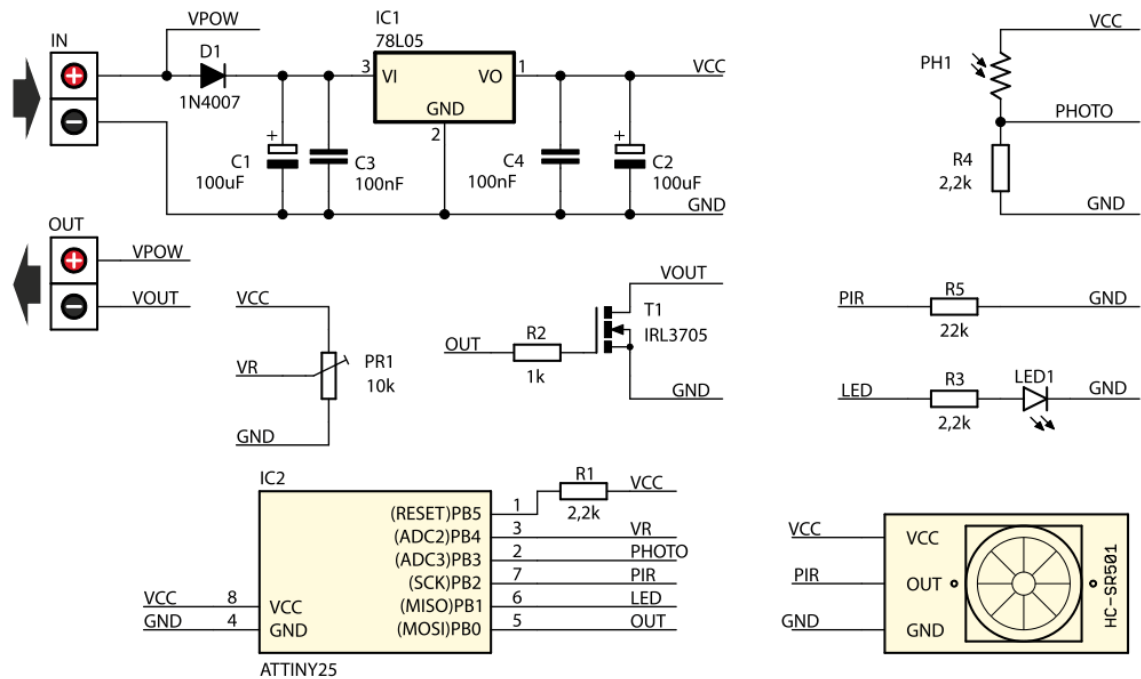
Mounting and start-up

The unit must be mounted on a 33x65mm PCB, the mounting diagram is shown in Figure 2. Start mounting the circuit by soldering resistors and other small components onto the board, and finish by assembling the socket, electrolytic capacitors, transistor, screw terminals and PIR module. Once assembled, the system is immediately ready for use, requiring only the appropriate configuration.

Figure 2. Arrangement of components on the PCB
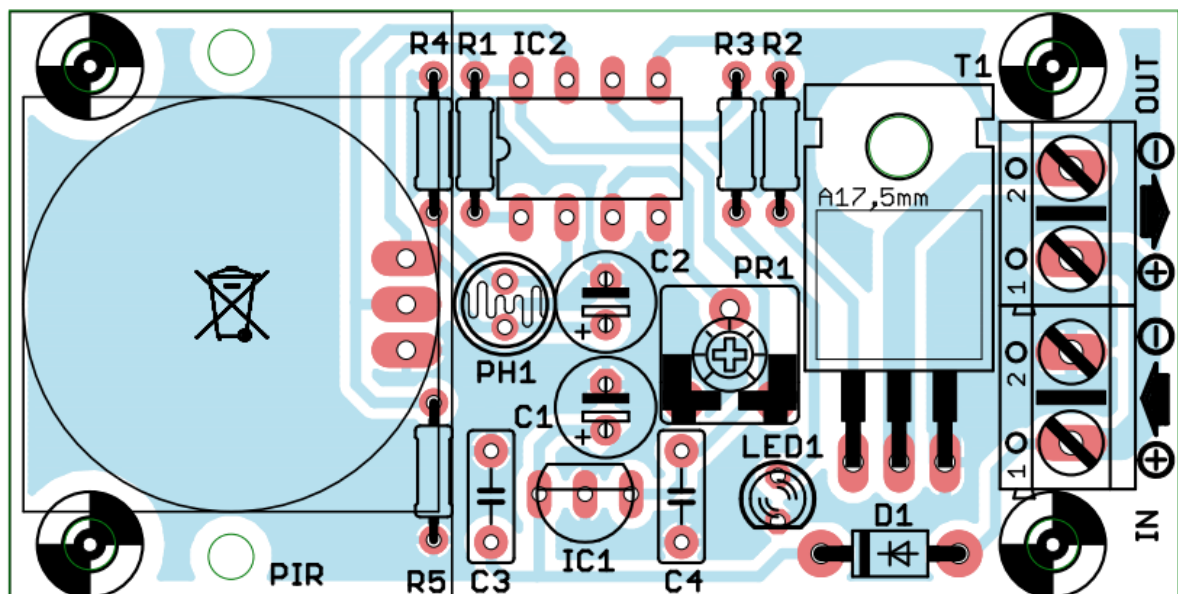
List of components

Resistors:

R1, R3, R4:	2.2 kΩ
R5:	1 kΩ
R2:	22 kΩ
PH1:	Photoresistor
PR1:	mounting potentiometer 10 kΩ

Capacitors:

C1, C2:	100 µF / 16 V !
C3, C4:	100 nF

Semiconductors:

IC1:	78L05 !
IC2:	IRL3705 !
D1:	1N4007 !
LED1:	LED !

Other:
HC-SR501 motion detector !

IN, OUT	DG301-5.0/2

Begin assembly by soldering the components onto the board in order of size from smallest to largest. When mounting components marked with an exclamation mark, pay attention to their polarity
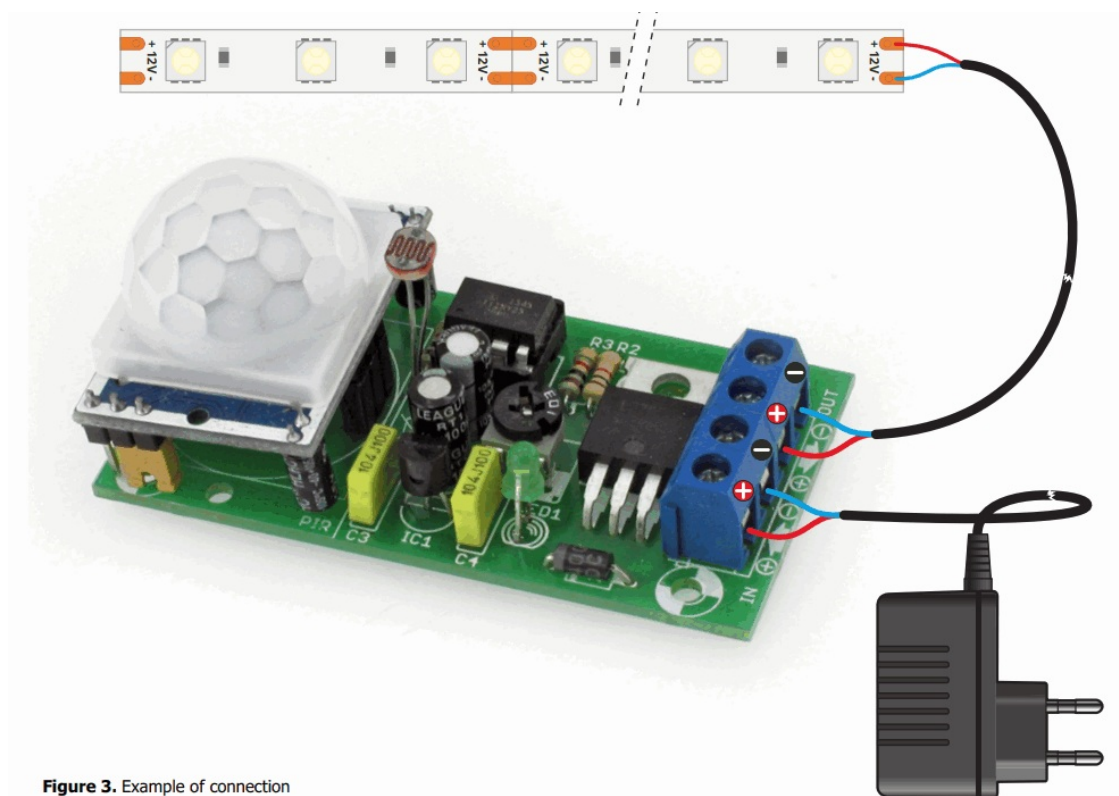
Figure 3. Example of connection

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 and electronic equipment.

AVT SPV reserves the right to make changes without prior notice.Installation and connection of the appliance not in accordance with the instructions, unauthorised modification of components and any structural alterations may cause damage to the appliance and endanger persons using it. In such a case, the manufacturer and its authorised representatives shall not be liable for any damage arising directly or indirectly from the use or malfunction of the product.

The self-assembly 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 regulations.

Documents / Resources

AVT AVT1996 Bedlight Night-Light Controller with Motion Detector [pdf] User Guide
AVT1996 Bedlight Night-Light Controller with Motion Detector, AVT1996, Bedlight Night-Light Controller with Motion Detector, Controller with Motion Detector

References

- **Internetowy Sklep Elektroniczny - AVT - Sklep z Elektroniką**

Manuals+,