

HS2144T--TECHNICAL DESCRIPTION:

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The HW2144T is a battery powered motion detector that transmits both an ON and OFF signal for control of a matching receiver, which in-turn controls a relay to switch a 60HZ 120VAC lamp load (typically a lamp load). The RF is 312MHZ ASK. There is a selectable timer between the ON and OFF transmissions to provide some usable load ON-time.

The case is made of plastic and measures 3.2 inches in height, 3.32 inches in width, and 3.05 inches deep. The case is two main pieces, the top and bottom. A lens is mounted on the front of the case and is used to focus heat to the PIR detector inside the case. There is one circuit board that contains all electronics except the battery pack. The board mounts vertically in the case and extends from the bottom to the top. The battery pack mounts immediately behind the PCB. The antenna is two dimensional, and is partially in the plane of the PCB and also a wire mounted vertically to the board and forming one big loop. The electronics is accessed through a removable plastic door on the bottom section of the case and allows battery changes, as well as changing the day/night switch (slide switch), changing timer times (slide switch), and changing the RF address (.1 inch jumpers & header). The back of the case has a slot for wall mount to be used with the case and is capable of swiveling via a ball and socket joint, allowing the aiming of the lens towards the area of expected motion (PIR via heat change detection).

There are two user switches on the HW2144T. The first switch is used for selecting operation during the nighttime only or both day and night. The second switch is a three position switch which allows the time selection between the ON and OFF transmissions. The switch settings are for 6 seconds, 5 minutes, and 10 minutes.

There are two user selectable jumpers that allow four different encoder/decoder addresses in the case the user wants to use more than one device in a given area (within RF range).

Operation: When motion is detected (PIR sensor) a two second timer is started (CD4538), during which time a modulated ON signal is transmitted (2 sec) using a Motorola MC145026 encoder, after which a simple RC timer is started, then times out, then causing a second 2 second timer to start during which (CD4538), time an OFF signal is transmitted (2 sec). In this manner the RF motion detector controls, through the receiver, an AC powered load (60HZ @120VAC--using relay), typically a light. The MC145026 modulator is a pulse-width type and has a worst case 33% duty cycle. It transmits a HIGH for the ON signal, then a HIGH for the OFF signal. The data bit period is 3.2ms. Two used address bits are also transmitted.

The RF section is a simple one-transistor 312MHZ Colpitts oscillator, LC tuned, and employing a loop antenna. The tuning is done via a PCB mounted variable capacitor. The RF section operates off of a 4.4V regulator so the range and performance are consistent over the usable battery life.

The power supply is four Alkaline AA-cells for a total of 6VDC. The output directly supplies a 4.4V regulator, which in turn supplies the complete circuit.