

MX-40 Technical description

MX40 has a microwave Doppler (MW) detector and a Passive infrared (PIR) detector. When both detectors detect a human at the same time, MX-40 outputs an alarm output from terminal. And LED indicates alarm conditions.

MW detector transmits and receives S-band microwave (2.45 GHz).

If there is a moving human in the detection area, it causes changes in received microwave frequency (Doppler effect). MW detector outputs signals when there are such changes.

PIR detector detects temperature contrasts between human body and back ground in the detection area.

Block diagram description

MW SENSOR

MW SENSOR transmits and receives S-band microwave (2.45 GHz).

If there is a moving object in the detection area, it causes changes in received microwave frequency (Doppler effect). MIXER outputs signals when there are such changes.

Fundamental microwave frequency is generated by OSC, and Microwave is emitted from the antenna (Inverted L type antenna $\lambda/4$) through MIXER. The reflections of Microwave at objects in the detection area are received at the antenna, and mixed at MIXER with fundamental microwave frequency. If there is human moving in the detection area, the microwave frequency is added with moving speed of the human for Doppler effect. Then MIXER outputs the Doppler signals (1 ~ 10HZ) to AMPLIFIER.

- AMPLIFIER

Signals from MW SENSOR are amplified at AMPLIFIER (90dB).

- COMPERRATOR

Amplified signals are compared with the threshold level at COMPERATOR. If the signal exceeds the threshold level, the detection signal shall be output to TIMER.

- TIMER

The detection signal is hold for the predetermined period at TIMER.

The switch connected with TIMER in CUSTOM IC is activated by the detection signal from TIMER. PIR signals are accepted during this period.

- PIR SENSOR

Infrared radiations from human body are focused with optics and received with pyro-element. Pyro-element converts infrared radiations to electrical signals.

- AMPLIFIER

Signals from PIR SENSOR are amplified at AMPLIFIER.

- COMPERATOR

Amplified signals are compared with the threshold level at COMPERATOR. If the signal exceeds the threshold level, the detection signal shall be output to PULSE COUNT.

- PULSE COUNT

During the switch between COMPERATOR and PULSE COUNT is ON, PULSE COUNT counts the signals from COMPERATOR. If PULSE COUNT counts over the predetermined counter in the predetermined period, the detection signal shall be output to OUTPUT TIMER. The predetermined counter can be selectable 2 or 4 with PULSE COUNT SWITH.

- OUTPUT TIMER

The detection signal is hold for the predetermined period at OUTPUT TIMER. RELAY DRIVE and LED DRIVE activated during this period.

- RELAY DRIVE, LED DRIVE

The alarm output relay and the LED for alarm indication shall be activated during the period of OUTPUT TIMER activation.