

ERMO 482-200 Microwave Sensor Description of Operation

Introduction

The ERMO 482-200 microwave sensor is a field disturbance sensor “that establishes a RF field in its vicinity and detects changes in that field from the movement of persons or objects within its range” (47 CFR Part 15 §15.3(1)). The sensor is comprised of two separate components: a transmitter and a receiver each housed in their respective, yet visually identical, radomes.

Functionality

When properly installed, according to the Installation Guide, the sensor can cover distances from between 50 and 200 meters (165 – 655 feet) in length. When a person or an object with sufficient cross section passes between the transmitter and receiver, the receiver alarm relay contacts are activated. Tamper contacts in the transmitter and receiver are activated with the removal of the antenna radomes.

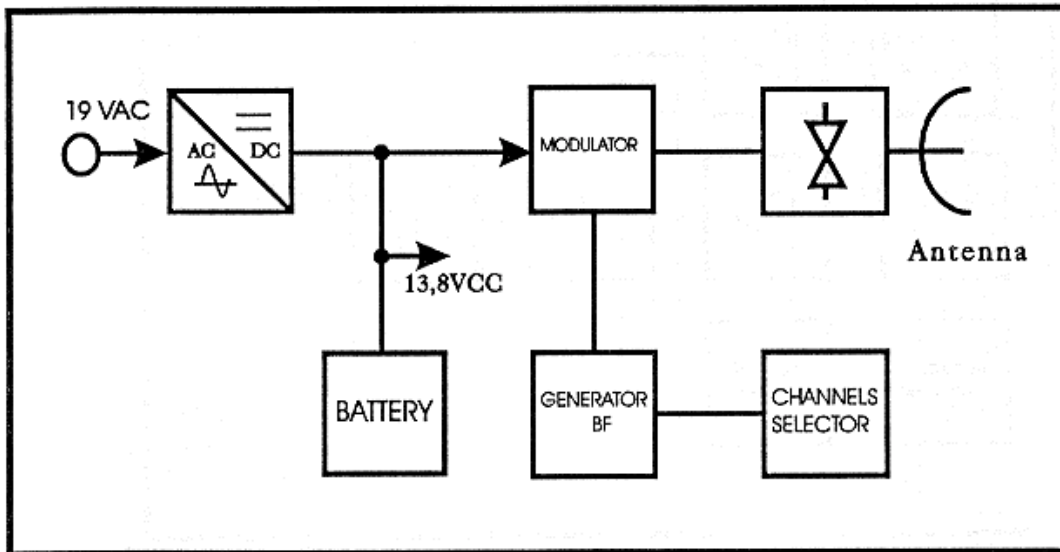
Transmitter Description

The transmitter is powered by 19 Vac which is rectified and regulated to simultaneously charge a 12 Vdc sealed lead acid battery and power the remaining transmitter circuitry. A further 9 Vdc linear regulator is employed to isolate the transmitter operation from variations in supply voltage levels. A LM555 timer is configured as an astable multivibrator with four user selectable operating frequencies (3, 5, 7 & 11 kHz with 50% duty cycles) to permit the operation of multiple co-located units by digitally modulating the carrier frequency of 10.525 GHz.

There are no user controls that vary the output level or carrier frequency.

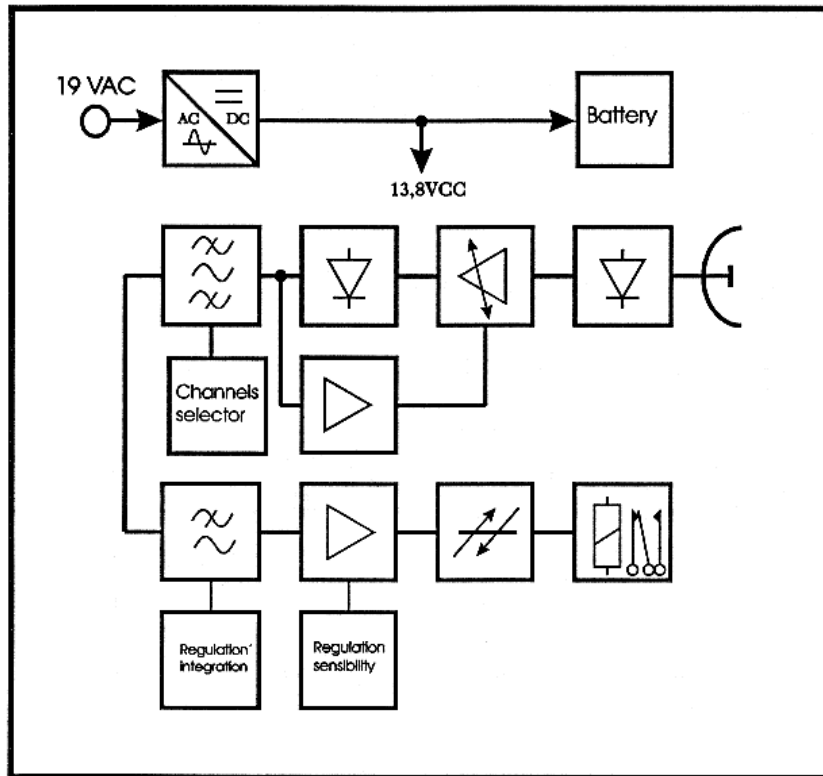
Receiver Description

The receiver is powered by 19 Vac which is rectified and regulated to simultaneously charge a 12 Vdc sealed lead acid battery and power the remaining receiver circuitry. A further 5 Vdc linear regulator is employed to isolate the receiver operation from variations in supply voltage levels. The received signal is amplified, filtered and the modulation frequency recovered through the use of a LM567 Tone Decoder, which is configured by the user to the same modulation as set on the corresponding transmitter (3, 5, 7, & 11 kHz). The user also adjusts the integration time and sensitivity (threshold) for the desired level of operation.



Microwave Transmitter Block Diagram:

Transmitter Carrier Frequency 10.525 GHz
Modulation Frequencies 3, 5, 7, & 11 kHz



Microwave Receiver Block Diagram:

Tone Decoder Frequencies 3, 5, 7 & 11 kHz