

OmniSmart Theory of Operation

In the communication protocol, the data send by the reader to the chip is mixed with the 13.56MHz carrier, amplified and sent to the antenna coil.

An ASK signal coming from the chip is recognized by the reader as an amplitude modulation of the carrier signal.

The reader needs two steps for a full recovery of the data. The first step is demodulating the backscattering signal, and the second step is to adapt the level to the microcontroller that performs the signal decoding.

The demodulation is accomplished by detecting the envelope of the carrier signal. A half-wave capacitor-filtered rectifier circuit is used for the demodulation process. A diode detects the peak voltage of the backscattering signal. The demodulated signal must then pass through band pass filter, amplifier and trigger (signal shaping) circuit before it is fed to the microcontroller.

A photoelectric detection mechanism is utilized to determine if the reader has been removed from its mounting surface.

The microcontroller performs data decoding and communicates using industry standard protocols including Wiegand, clock & data, and an asynchronous serial data stream utilizing an open-collector interface.