## EasyBee / ZBMR10 Modulation

## Modulation Type

The modulation format is 2.4 GHz direct sequence spread spectrum (DSSS) RF modulation format defined in IEEE 802.15.4.

## Symbol Format

Each byte is divided into two symbols, 4 bits each. The least significant symbol is transmitted first. For multi-byte fields, the least significant byte is transmitted first, except for security related fields where the most significant byte it transmitted first.

Each symbol is mapped to one out of 16 pseudo-random sequences, 32 chips each. The chip sequence is then transmitted at 2 MChips/s, with the least significant chip transmitted first for each symbol.

## Modulation Format

The modulation format is Offset – Quadrature Phase Shift Keying (O-QPSK) with half-sine chip shaping. This is equivalent to MSK modulation. Each chip is shaped as a half-sine, transmitted alternately in the I and Q channels with one half chip period offset.