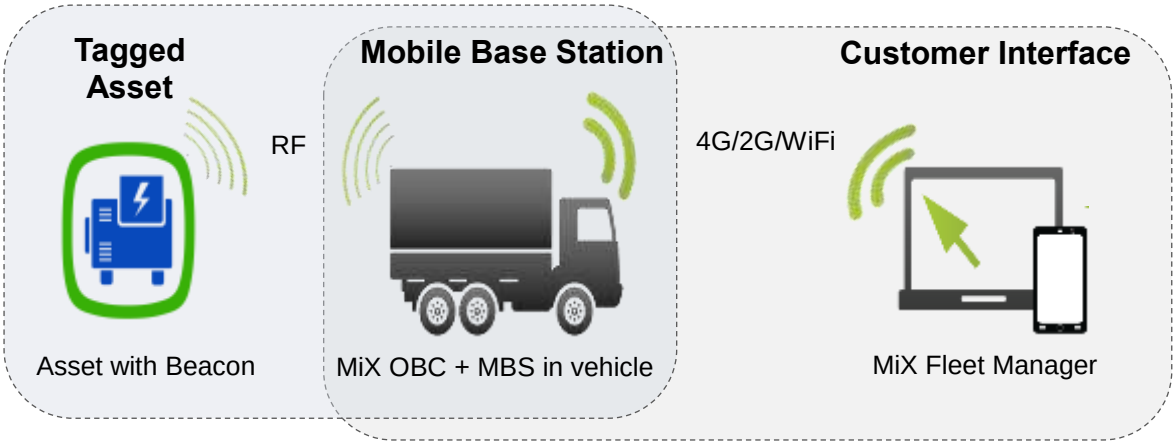
1 Overview

The MiX 46MC-4G/MiX 46MC-4G-B is the 4G (with 2G fall back) Variant of the MiX4000 range of fleet products. It consists mainly of an on-board computer, a 4G modem, a GNSS receiver, an accelerometer, Low Energy Bluetooth and 434 & 915MHz short range transceivers.

The only difference between the MiX 46MC-4G and the MiX 46MC-4G-B is that the MiX 46MC-4G-B contains a plugged in backup battery.

1.1 915MHz Transceiver

The 915MHz transceiver forms part of the MiX Telematics Tabs Network used for mobile asset monitoring and tracking. The MiX 46MC-4G/MiX 46MC-4G-B is the latest Tabs enabled product which will act as a base station as shown in the diagram below, by providing an RF communications link with tagged assets in range.



1.2 Frequency Hopping Technique

In order to meet the requirements of 15.247(a)(1) the 915MHz channel has been divided into 64 channels numbered 0 to 63. Each channel is 400kHz wide with the first channel starting at 902.2MHz, the middle at 915MHz and the top at 927.8MHz.

The 64 channels are selected using a pseudo random generator algorithm that outputs the following sequence of channels:

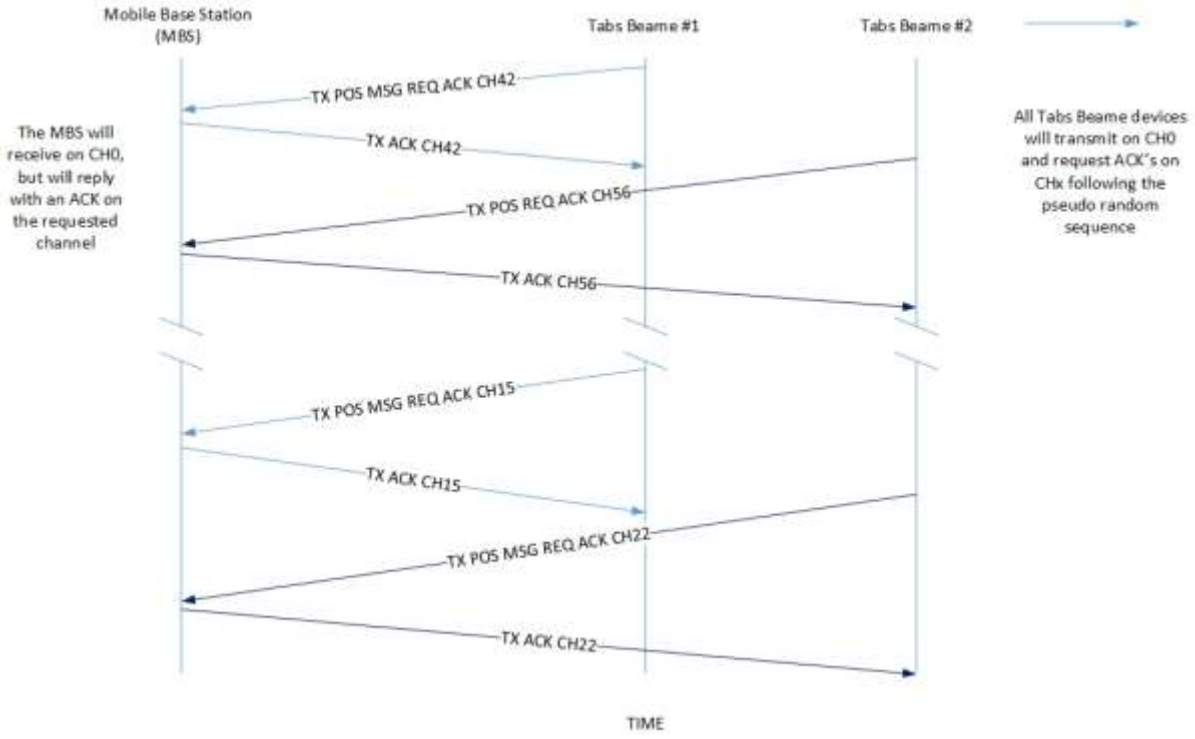
{0, 48, 30, 28, 35, 61, 21, 11, 31, 18, 53, 41, 62, 47, 44, 40, 45, 14, 24, 17, 52, 13, 39, 50, 8, 37, 55, 12, 34, 2, 59, 25, 42, 15, 9, 6, 54, 46, 27, 10, 33, 5, 38, 26, 58, 51, 63, 60, 23, 57, 56, 22, 1, 32, 3, 49, 20, 16, 29, 4, 36, 19, 43, 7}

Once the sequence has finished it is then repeated and so on.

1.3 Air Protocol

The MiX4000 is designed to act as a mobile base station (MBS) for the Tabs Beame asset tracking devices. The MBS will receive position data from the Beame devices on Channel 0. Within the position message is an ACK channel number which the MBS will switch to when it transmits the ACK back to the Beame device. This sequence is shown in the diagram below.

The Beame device will request ACK's from the MBS on channels selected by the same pseudo random algorithm as defined in section 1.2 above. So for every position message transmitted by the Beame device the ACK will be received on a pseudo random channel. The Tabs Network system is inherently random due to the power-up times of the Beame device, so in areas where there are multiple Beame devices, they will be requesting ACK channels at different points within the pseudo random algorithm.



Both the ACK and Position transmissions are 11ms long and transmitted at a data rate of 19200 pbs using 2 level FSK.

2 Bluetooth Low Energy (BLE)

The MiX 46MC-4G/MiX 46MC-4G-B design incorporates the TI CC2564BRVMR Bluetooth controller. The controller is a single-chip solution and is only used in BLE mode of operation. The controller is qualified (QDID 58852) and compliant up to the HCI Layer.

The antenna is integrated into the PCB and follows the TI guidelines.