Designated frequency hopping algorithm:

Pseudorandom Frequency Hopping Sequence

Our system is use frequency hopping system. There are total 17 non-overlap channels in our hopping table shown below.

Channel Index	Frequency (MHz)
Channel 1	2409
Channel 2	2413
Channel 3	2417
Channel 4	2421
Channel 5	2425
Channel 6	2429
Channel 7	2433
Channel 8	2437
Channel 9	2441
Channel 10	2445
Channel 11	2449
Channel 12	2453
Channel 13	2457
Channel 14	2461
Channel 15	2465
Channel 16	2469
Channel 17	2473

According to the communication environment, our system will take a random strategy let 17 channels into 17 difference hopping index be established a hopping index table as shown below.

Hopping Index	Channel Index
HI 1	Channel 9
HI 2	Channel 13
HI 3	Channel 5
HI 4	Channel 16
HI 5	Channel 1
HI 6	Channel 10
HI 7	Channel 8
HI 8	Channel 6
HI 9	Channel 17
HI10	Channel 14
HI11	Channel 2
HI12	Channel 11
HI13	Channel 4
HI14	Channel 7
HI15	Channel 15
HI 16	Channel 3
HI 17	Channel 12

After a hopping index be used 256 times, our system will take a random strategy to establish a new hopping index table maybe as shown below.

Hopping Index	Channel Index
HI 1	Channel 14
HI 2	Channel 7
HI 3	Channel 11
HI 4	Channel 4
HI 5	Channel 15
HI 6	Channel 17
HI 7	Channel 1
HI 8	Channel 8
HI 9	Channel 10
HI10	Channel 5
HI11	Channel 12
HI12	Channel 16
HI13	Channel 9
HI14	Channel 3
HI15	Channel 2
HI 16	Channel 13
HI 17	Channel 6

Now we give an example that how to generate our hopping sequence. After the hopping index table is established, our system will generate a random value for the hopping interval. If the successive two random values are 4 and 6, we will get the hopping sequence shown below. The red region uses the random value 4 and the blue one uses the random value 6.

HI 1 -> HI 5 -> HI 11 -> HI 15 -> HI 4 -> HI 8 -> HI 14 -> HI 1 -> HI 7 -> HI 11 -> HI 17 -> HI 4 -> HI 10 -> HI 14 -> HI 3 -> HI 7 -> HI 13 -> HI 17 -> HI 6 -> HI 10 -> HI 16 -> HI 3 -> HI 9 -> HI 13 -> HI 2 -> HI 6 -> HI 12 -> HI 16 -> HI 5 -> HI 9 -> HI 15 -> HI 2 -> HI 8 -> HI 12 -> HI 1

Equal Hopping Frequency Use

To guarantee the equal hopping frequency use, each frequency channel has the using times record in our system. The using times record will be added one when one frequency channel is used. Therefore we will compare the using times record before we decide the next frequency channel in the hopping sequence. When the using times record is larger than what we expect, we will bypass this frequency channel and than check next one until each frequency channel has the same times record value that we expect. This mechanism guarantees the equal hopping frequency use.

System Receiver Input Bandwidth

L.O. frequency of receiver: 4,000 K Hz

System Receiver Hopping Capability

A two-way low speed data channel makes it possible to exchange information. The transmitter will generate the adaptive hopping sequence and transmit hopping information to the receiver. The receiver will shift frequency following this hopping information. Therefore out system has the ability to keep frequency channel switch in synchronization.

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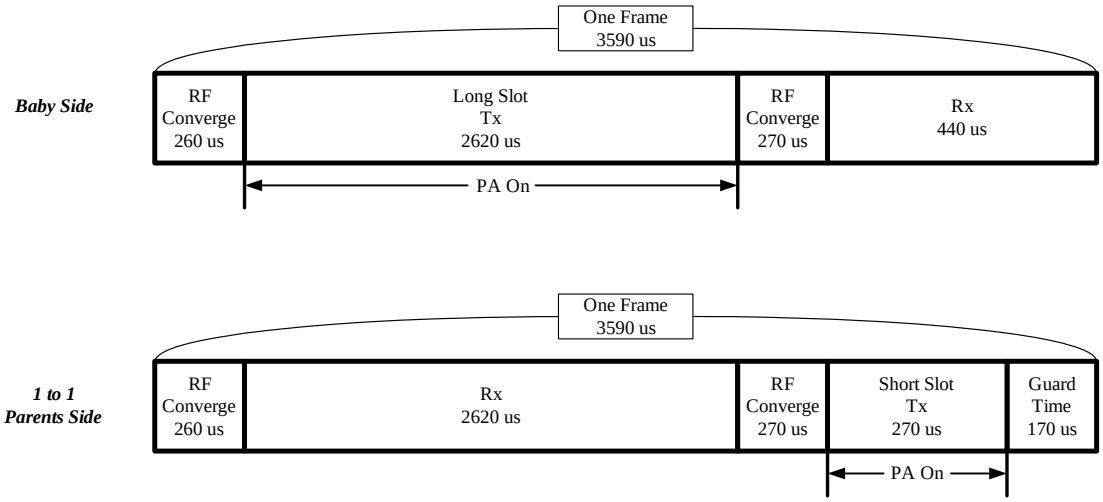
The hopping sequence is generated by the transmitter. Therefore the different transmitters will generate the different hopping sequences. Besides, our device has a unique user ID for link registration and the transmitted hopping information is encrypted. If user ID is not match, no other FHSS system can join the link with our devices. If no decryption ability, other FHSS system will not follow our hopping sequence to shift frequency.

Data frame structure:

Timing structure


Baby Side
One Frame
3590 us
RF
Converge
260 us
Long Slot
Tx
2620 us
RF
Converge
270 us
Rx
440 us
PA On
1 to 1
Parents Side
One Frame
3590 us
RF
Converge
260 us
Rx
2620 us
RF
Converge
270 us
Short Slot
Tx
270 us
Guard
Time
170 us
PA On