

TRX- module transmit time
Averaging factor for FCC in the 902MHz band for the TRX module

The TRX-module send an acknowledge signal back to the PSC (bidirectional key) if the RKE signal has been received correctly. The PSC can also initiate comfort messages and status queries.

1 Bidirectional RKE messages

Bidirectional RKE message is shown in figure 1, timings are given in table 1

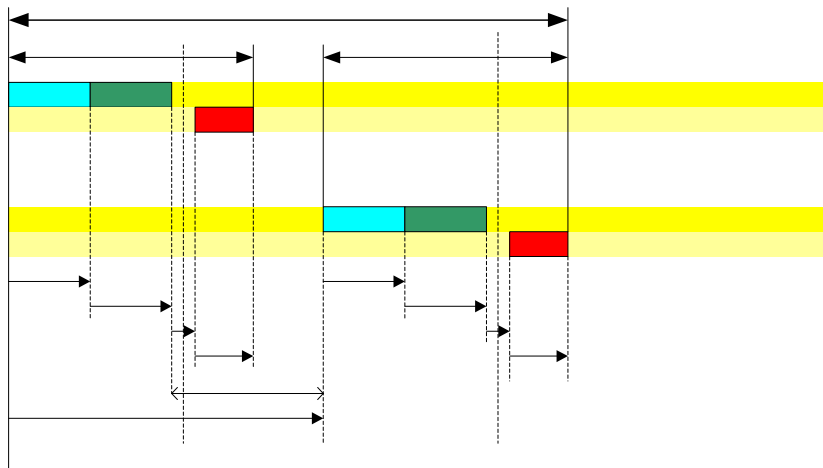


Figure 1: Timing of bidirectional RKE message

Timing parameter [ms]	Europe	US	Japan	Korea	China
T1 Duration of WUP	166.7	166.7	166.7	200.0	166.7
T2 Duration of Fr1	32.3	32.3	77.5	155.0	32.3
T3 Start of transmission of Ack	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5
T4 Duration of Ack	21.2	21.2	50.8	101.7	21.2
T5 Start of transmission on ch2	250	250	350	550	250
Tstd Standard Response Time (f1)	200	200	247	361	200
Text Extended Response Time (f2)	450	450	597	917	450
Tspace Space between data frames in a burst	51	51	106	195	51

Table 1: Timing values for general bidirectional RKE messages

Block 2

WUP

WUP

T1
T2
T3

2 Bidirectional status query messages

Bidirectional status query message is shown in figure 2, timings are given in table 2

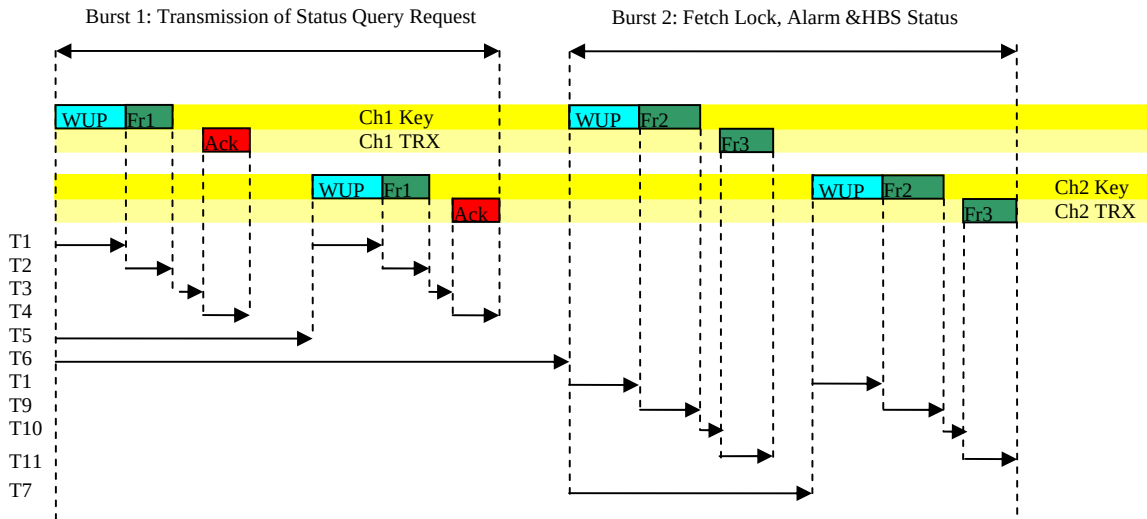


Figure 2: Timing of bidirectional status query message

Parameter	Europe	US	Japan	Korea	China
Fr1 length [bits]	186	186	186	186	186
Fr2 length (Fetch status) [bits]	122	122	122	122	122
Fr3 length (Response status) [bits]	186	186	186	186	186
T1 Duration of WUP [ms]	166.7	166.7	166.7	200.0	166.7
T2 Duration of Fr1 [ms]	32.3	32.3	77.5	155.0	32.3
T3 start of transmission of Ack for Fr1 [ms]	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5
T4 Duration of Ack (w/o data) [ms]	21.2	21.2	50.8	101.7	21.2
T5 start of transmission on PC2 [ms]	250	250	350	550	250
T6 start of transmission of Fetch telegram on PC1, if PSC received Ack on PC1 [ms]	6729	6729	6810	6985	6729
T6 start of transmission of Fetch telegram on PC1, if PSC received Ack on PC2 [ms]	6976	6976	7153	7520	6976
T7 start of transmission of Fetch telegram (lock & alarm) on PC2 [ms]	500	500	500	500	500
T9 Duration of Fr2 [ms]	21.2	21.2	50.8	101.7	21.2
T10 start of transmission of Fr3 (lock & alarm) [ms]	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5
T11 Duration of Ack (w data) [ms]	32.3	32.3	77.5	155.0	32.3

Table 2: Timing values for PSC messages

3 Calculation of the averaging factor according to FCC in the US

The window which will be used for calculation of the averaging factor is 100ms. The worst case for the TRX-module would be if the status query is sent back to the PSC, which is 32.3ms according to table 2 above.

The averaging factor for FSK modulation is then given by:

$$averaging = 20 \times \lg\left(\frac{T_{ON}}{100ms}\right)$$

$$averaging = 20 \times \lg\left(\frac{32.3}{100ms}\right) = -9.84dB$$