

BEARTOOTH

The Beartooth MK II uses the XBee Pro SX module, FCC ID MCQ-XBPSX, for its 900 MHz radio. In the XBee-PRO 900 MHz test report, filed as an exhibit in its FCC equipment grant application, the module is reported as limited to an 11% duty cycle.

This limitation may be found on page 17 of the FCC report:

| hopping frequencies. | | See Note 2 |
|---------------------------|---|---|
| Average Time of Occupancy | If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period. If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. | XBX0 10kbps: 0.398 in 20s XBX1 110kbps: 0.076 in 10s XBX2 250kbps: 0.021 in 10s XTC0 10kbps: 0.275 in 10s XTC1 125kbps: 0.173 in 10s XTCA0 10kbps: 0.378 in 20s XTCA1 125kbps: 0.387 in 20s |

The XBEE Modules ship with a default 250 kbps data rate. We do not make any changes to this setting. Hence the MK II operates using the 250 kbps data rate

Per the test report we can make the following calculations from this table:

Maximum time on one channel in 10 seconds = 0.021

Maximum time on one channel in 1 seconds = 0.0021

Number of channels = 50

Maximum time transmitting in 1 second = $0.0021 * 50 = .105$

Max throughput Duty cycle = .105 / 1s = 11%

This rate set in the XBee-PRO SX module and is the limit for the MK II.

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Michael C. Monaghan
Founder | CEO Beartooth Radio

and

H. Stephen Berger
Regulatory Agent for Beartooth Radio, Inc.