3000 Research Drive, Richardson, TX 75082
469.624.8000 / 800.222.0193 / 469.6247153 fax
www.amx.com

NXR-MO
Theory of Operation

The NXR-MO is a wireless module that uses a radio chipset based on the Eber EM250 Zigbee radio transceiver chip. The antenna is integral to the device (etched on the PWB). The EM250 chip uses an on-chip 4.8 GHz VCO. A 24 MHz crystal oscillator is used to establish the PLL reference signal.

The radio transmitter utilizes an efficient architecture in which the data stream directly modulates the VCO. An integrated PA boosts the output power. The calibration of the TX path as well as the output power is controlled by the digital logic.

The radio receiver is a low-IF, super-heterodyne receiver. It utilizes differential signal paths to minimize noise interference, and its architecture has been chosen to optimize co-existence with other devices within the 2.4 GHz band (namely, IEEE 802.11g and Bluetooth). After amplification and mixing, the signal is filtered and combined prior to being sampled by an ADC.

Data transmission rate is 250 kbps. Channels are numbered 11 – 26 and are centered on the frequencies below.

Channel	Center Frequency (MHz)
11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
26	2480

Channel bandwidth is 2 MHz. Occupied bandwidth is 1.6 MHz.

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The recommended operating range is -40 to +85 degrees Celsius. Over this frequency range the frequency stability is rated at +/- 40 ppm which would be a maximum drift of 99.2 kHz.

Modulation is O-QPSK (Offset Quadrature Phase Shift Key) and the rf carrier is spread using Direct Sequence spreading.

RF power output is +4 dBm. The nominal gain of the integral antenna is 0 dBi.

The NXR-MO is designed as a stand-alone module and is intended to be used by AMX in their line of remote control devices.