

## MHX-920E Operational Description

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### 1.0 Operational Description

The MHX-920E is a high-performance embedded spread spectrum data transceiver. Users communicate with this module via an asynchronous RS-232 interface. All data that users send to the module is buffered in banks of SRAM memory, packetized with the appropriate header information, and sent over the air at a fixed bit rate. The microprocessor inside the module precisely controls the bit-width, packet size, and hopping algorithm, to ensure that the RF occupied bandwidth and channel dwell-times remain constant. Users have no ability to modify the occupied bandwidth of the transmitted data.

Users power the module from a 5 - 5.5V source. Linear regulators and biasing ensure that increases to the supply voltage will not increase the transmitted power, which is limited to 1W, or in the case that the module is sold with high gain antennas, the transmitted power is factory-limited to 100mW.

The MHX-920E modem can be configured for a wide range of applications. The module is designed such that all communication is through one serial port (Pins 21 to 28 on the module). This port has two functions:

1. It provides the asynchronous interface with the host equipment for data that is sent/received on the RF channel. When operating in this fashion, the module is said to be in **data mode**.
2. It is also used for configuring and programming the module. When operating in this fashion, the module is said to be in **command mode**.

The functionality of any particular MHX-920E can be configured as follows:

- **Master Point-to-Point:** The modem is configured to communicate with a single *Slave*, either directly, or through one or more *Repeaters*.
- **Master Point-to-Multipoint:** The modem is configured to communicate with one or more *Slaves* and/or *Repeaters*.
- **Slave:** The modem is configured to communicate with one *Master* either directly or through one or more *Repeaters*.
- **Repeater:** The modem is configured to pass information from either a *Master* or another *Repeater* onto subsequent *Repeaters* and/or *Slaves* and vice versa. The *Repeater* also acts as a *Slave* in the sense that, like a *Slave*, it passes information to/from its serial port.

The MHX-920E is a frequency hopping transceiver, meaning that it “hops” to a new frequency after a predetermined time interval. This time interval is a fixed time set by the user, and can range from 8ms to 120ms. The MHX-920E hops according to a pseudorandom pattern of 50 different channels. Each of the 50 channels is used once in the pseudorandom pattern, and the dwell time is equal among channels. There are 64 available channels with spacing of 400 kHz starting at 902.4 MHz and going up to 927.6 MHz. The system receiver input bandwidth is 350 kHz

The RF connector on the module is an MCX straight PC mount jack. The manufacturer's part no. is:

Johnson # 133-3701-211