
RF DATA CORP.
'Sensor Mate' RADIO MODEM USER MANUAL
RFD-8 Ver. 1.0, 8/98

1. Overview

Sensor Mate is a frequency hopping spread spectrum radio modem which is ~~non~~-licensed under Part 15 of the FCC Rules. It is an ISM Band device which operates between 907 and 922 MHz on 64 channels with a channel spacing of 240 KHz and is not required to be licensed for operation by the end-user.

Sensor Mate transmits short blocks of data preceded by a header containing routing information and followed by forward error correction bytes. The data bits are further scrambled and interleaved for enhanced interference rejection. The software protocol supports 're-tries' and 'acknowledgements'.

At power up the device first listens for any incoming messages in order to synchronize its hopping timebase. If there are no incoming messages, the device proceeds to broadcast a request for identification on each hopping channel until it either receives an answer or has polled all of its channels. If after polling it receives no answer it considers that there are no network nodes available in its transmit range.

2. Setup

The device has no user configurable switches, jumpers or any user settings or adjustments. Power is provided by a standard regulated 1A power supply. The device uses a standard RS232 connection to receive data from, and transmit data to a computer.

The RF modem is configured as a Computer Terminal Device, since its most common application is to be attached to digital sensors, dataloggers, and to other devices which require the device to emulate a PC in the system. Therefore a male to male DB-9 cable is required. This cable is not a straight cable as pins 2 and 3 are twisted.

3. Commands

Once powered up, the RF modem executes a 'self test' and 'network identification' without user intervention. For test purposes, however, there are some user test commands which can be issued to the modem using any terminal type program.

The most useful commands for testing purposes are:

- **Request** modem to transmit on the lowest frequency channel -
Command = send the ASCII "L" to the modem over RS232
- **Request** modem to transmit on the highest frequency channel -
Command = send ASCII "H" to the modem over the RS232
- **Request** modem to broadcast on all hopping channels -
Command = send ASCII "A" to modem over RS232
- **Request** modem to switch in continuous receive mode -
Command = send ASCII "R" to modem over RS232
- **Request** modem to enter idle mode in which no transmit or receive will take place except for monitoring the RS232 interface commands -
Command = send ASCII "I" to modem over RS232

4. Notes

- All the above commands must be transmitted at 19.2kbps, 8,1,N without any hardware or software handshaking.
- The device responds to all commands received over the RS232 connection. An "A" is returned if the command was received and accepted. A "B" is returned if there is an error such as: receipt of an unrecognized command, a command which is not received properly, or a command sent for testing purposes while the modem was still executing a previous command.
- As this device is solely intended to be used for data transmission there is no capability for continuous transmission. If the device is called on to transmit for an excessive amount of time (depending on factors such as ambient temperature 'excessive' may be anywhere from 5-10 minutes) the firmware will either shut the unit down or reduce the output power to dissipation levels which are safe for continuous use.

NOTICE:

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The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this device. Such modifications could void the user's authority to operate this device.

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