

# MDS 9810

902-928 MHz  
Frequency Hopping  
Spread Spectrum  
Transceiver

# industrial wireless PERFORMANCE



## FEATURES

- Up to 19.2 kbps Data Throughput
- Transparent Operation with Async Protocols
- Full Duplex Operation at 9600 bps
- End-to-End Delays of only 7 milliseconds
- Maximum Allowable Transmit Power - 1 Watt
- Forward Error Correction
- Software Enhanced Mode for Increased Data Integrity
- High Performance Receiver
- Sleep Mode for Solar Powered Sites
- Programmable Selection of Preferred Channels
- Deterministic Data Response for Real-time SCADA Control
- Field Configurable as Master or Remote Radio
- Master Radio Controls All Network Parameters of Remote Radios
- Peer-to-Peer Communications
- Single Radio can be used as a Repeater

## APPLICATIONS

- Gas/oil production and distribution
- Water, gas and electric utilities
- Lotteries
- Traffic control
- Industrial process control
- Railroad communication systems

## MDS...Global wireless solutions. Industrial Wireless Performance.

For over 15 years, Microwave Data Systems (MDS) has been providing wireless networking solutions with applications in SCADA, telemetry, telecommunications, and online transaction markets. MDS provides licensed and unlicensed solutions, with more than 500,000 radios installed in over 110 countries.

## MDS 9810 Product Overview

The MDS 9810 offers a narrow band, frequency hopping, spread spectrum radio giving increased throughput, long range alternatives to our customers' point to multipoint needs. Transparent and direct asynchronous communication offer real-time communication. No extra software or programming is needed to implement communications from standard asynchronous protocols.

The MDS 9810 can be used with a licensed MDS radio system or independently. It is field configurable as a master or remote radio. When operating as the master station it controls all network parameters of the remotes; when operating as a remote radio in the network, peer to peer communication is enabled as well. This product is available for use in Class I, Division 2, Groups A, B, C & D hazardous locations.\*

## Why Consider a MDS 9810 Solution?

**High system performance and data integrity!** Through robust construction, digital signal processing technology (DSP) with self-equalization and forward error correction we offer up to 19.2 kbps data throughput.

**Flexibility and rapid installation!** Quick return on investment due to simple installation, license free radio design as well as ability to communicate with any asynchronous protocol without extra software or extra programming. A single MDS 9810 can be configured as a repeater.

**Full Duplex!** The MDS 9810 includes a TDD operating mode that provides Full Duplex operation at a throughput of 9600 bps.

**Performance under the most adverse conditions!** Exceptional design provides excellent performance in the face of interference or difficult signal paths.

**Robust Mode** allows users to customize the error vs. throughput performance of the MDS 9810 allowing even better weak signal performance under adverse conditions.

**Network Wide Diagnostics!** InSite Network Management software simplifies tasks and reduces the cost of managing the network infrastructure. Provides a non-intrusive means of maintenance and link monitoring.

The MDS 9810 is the price/performance leader; offering the flexibility and reliability for our customers' Multiple Address Systems needs.

industrial/wireless/performance



# MDS 9810 Radio Transceiver Specifications

## General

|                         |  |
|-------------------------|--|
| Frequency Band          | 902–928 MHz Part 15 Spread Spectrum Band   |
| Frequency Hopping Range | 8 selectable zones each containing 128 frequencies for a total of 1019 frequencies           |
| Operation               | Half Duplex (+/- 1.6 MHz Tx/Rx split) Simplex (peer-to-peer)<br>Full Duplex (point-to-point) |
| Frequency Stability     | ± 0.00015% (1.5 PPM)<br>–30° to +60°C (–22° to 140°F)  |
| System Addresses        | 1–65,000   |

## Data Characteristics

|                             |  |
|-----------------------------|--|
| Signaling Standard          | RS-232   |
| Connector                   | DB-25 Female   |
| Data Port Rates             | 1200, 2400, 4800, 9600, 19200, bps asynchronous (can accept 38400 bps) |
| Data Rate in the RF Channel | 22.5 kbps  |
| Average and Typical Latency | 7 ms typical (buffer off mode)   |
| Byte Length                 | 10 or 11 bits including start and stop and (opt.) parity               |
| Transparent Communications  | For all asynchronous protocols   |

## Transmitter

|                         |                                |
|-------------------------|--------------------------------|
| Power Output            | .1 to 1 Watt (20–30 dBm ± 1dB) |
| Duty Cycle              | Continuous                     |
| Output Impedance        | 50 ohms                        |
| Spurious Emissions      | –60 dBc                        |
| Harmonic Emissions      | –80 dBc                        |
| Transmitter Keying      | Data activated                 |
| Maximum SWR (No Damage) | Infinite, all phase angles     |

## Receiver

|                 |  |
|-----------------|--|
| Type            | Double conversion superheterodyne      |
| Bit Error Rate  | Less than 10 <sup>-6</sup> at –110 dBm |
| Intermodulation | 75 dB minimum (EIA)                    |
| Desensitization | 65 dB                                  |
| Spurious        | 70 dB minimum                          |

## Primary Power

|                             |   |
|-----------------------------|---|
| Voltage                     | 13.8 Vdc nominal<br>(10.5–30 Vdc Operating Range) |
| TX Supply Current           | < 500 mA @ 13.8 Vdc                               |
| RX Supply Current           | < 125mA @ 13.8 Vdc                                |
| Sleep Mode                  | < 30 mA @ 13.8 Vdc                                |
| Power Connector             | 6 foot (1.8 m) pigtail included                   |
| Fuse                        | 1.5 Amp polyfuse                                  |
| Reverse Polarity Protection | Diode across primary power input                  |

## Environmental

|                   |  |
|-------------------|--|
| Humidity          | 95% at 40°C (104°F); non-condensing  |
| Temperature Range | Full performance: –30° to + 60°C (–22° to 140°F)<br>Typical performance: –40° to +70°C (–40° to 158°F) |
| Size              | 2.0" x 5.625" x 7.25"<br>(5.0 x 14.3 x 18.41 cm)   |
| Weight            | 2.2 pounds (1 kg)  |
| Case              | Die-cast aluminum  |

## Diagnostics

|                                 |   |
|---------------------------------|---|
| RSSI                            | Received Signal Strength averaged over 8 hops |
| Main Supply Voltage             | 13.8 input voltage                            |
| Temperature                     | Internal Temperature                          |
| Signal Quality                  | Signal to Noise Ratio                         |
| Radio Status                    | Go/No-Go Indicator                            |
| 8 Zone Quality Level            | Availability of data in each Frequency Zone   |
| Radio alarm & status indication | External LEDs (PWR, SYNC, TXD, RXD)           |

## Agency Approvals

|                 |  |
|-----------------|--|
| FCC             | Part 15.247 FCC approved   |
| Industry Canada | RSS 210 approved   |
| UL              | Approved for UL 508, UL 1604   |
| FM/UL           | Approved for Class I, Div. 2; Groups A, B, C and D; hazardous locations* |

All Spread Spectrum radios operate in the unlicensed and unprotected 902–928 MHz band. Some level of interference to communications can be expected as part of normal radio system operation.

\* The transceiver is not acceptable as a stand-alone unit for use in the hazardous locations described above. It must either be mounted within another piece of equipment, which is certified for hazardous locations, or installed within guidelines, or conditions of approval, as set forth by the approving agencies.

industrial/wireless/performance



MICROWAVE DATA SYSTEMS INC.  
175 SCIENCE PARKWAY  
ROCHESTER, NEW YORK 14620, USA  
PHONE (585) 242-9600  
FAX (585) 242-9620  
WWW.MICROWAVEDATA.COM

MDS products are manufactured under a quality system certified to ISO 9001. MDS reserves the right to make changes to specifications of products described in this data sheet at any time without notice and without obligation to notify any person of such changes.  
© 2001 MDS Inc. (Part No. 9810) SL0010 Rev. N, 06-21-02