

DN-90 Series

900 MHz Wireless Serial Modems

- 900 MHz RS-232C and RS-232C/RS-485 Serial Modems
- Optional 128-Bit AES Encryption
- Point-to-point, Point-to-multipoint, Peer-to-peer and Store & Forward Capabilities
- Frequency Hopping Spread Spectrum Transceiver
- 100 kbps RF Data Rate
- Transmitter Power up to 158 mW EIRP with 2 dBi Antenna
- FCC and Canadian IC Certified for Unlicensed Operation

The DN-90 series 900 MHz serial modems provide a low cost, ready-to-use solution for robust wireless data communications in the 900 MHz ISM band. There are currently two products in the DN-90 series, the DN-90G and the DN-90GI. The DN-90G provides an RS-232C serial interface. The DN-90GI offers a selectable RS-232C or two-wire, multi-drop RS-485 interface. DN-90 series modems are based on RFM's DNT90 frequency hopping spread spectrum (FHSS) transceiver, and can communicate with other DNT90-based modems and sensor nodes, as well as customer developed products. DN-90 series modems are supplied with a dipole antenna and a wall-plug power supply. DN-90 modems transmit data at 100 kbps. Each modem's output power can be set up to 158 mW EIRP using the supplied 2 dBi dipole antenna. DN-90 series modems are well-suited for sensor and data networks carrying moderate traffic that need robust communications in locations with non-ideal RF propagation and/or where RF interference or noise are present.



DN-90 Absolute Maximum Ratings

| Rating | Value | Units |
|---|-------------|-------|
| Power Supply Input Voltage Range | -0.5 to +24 | V |
| Non-Operating Ambient Temperature Range | -40 to +85 | °C |

DN-90 Specifications

| Characteristic | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|-----|-------|---|---------|---------|-------|
| Operating Frequency Range | | | 902.76 | | 927.24 | MHz |
| Hop Dwell Time | | | 8 | | 100 | ms |
| Number of RF Channels | | | 25, 26 or 52 | | | |
| Modulation | | | FSK | | | |
| RF Data Transmission Rate | | | 100 | | | kbps |
| Receiver Sensitivity @ 10 ⁻⁵ BER | | | | -100 | | dBm |
| EIRP RF Output Power Level, 2 dBi Antenna | | | | | 158 | mW |
| Optimum Antenna Impedance | | | | 50 | | Ω |
| RF Connection | | | RSMA Coaxial Connector | | | |
| Network Topologies | | | Point-to-Point, Point-to-Multipoint, Peer-to-Peer and Store & Forward | | | |
| Access Schemes | | | Ad Hoc TDMA | | | |
| DN-90G RS-232C Configuration | | | 9-pin connector, hardware flow control optional | | | |
| DN-90GI RS-232C Configuration | | | 3-wire, no hardware flow control | | | |
| DN-90GI RS-485 Configuration | | | 2-wire, multi-drop capable | | | |

Discontinued

DN-90 Specifications

| Characteristic | Sym | Notes | Minimum | Typical | Maximum | Units |
|---|-----------------|-------|---|---------|---------|-------|
| Serial Port Baud Rates | | | 1.2, 2.4, 4.8, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6, 115.2, 230.4 | | | kbps |
| DC Power Supply Voltage Range | V _{CC} | | +9 | | +24 | Vdc |
| Peak Transmit Mode Current, 158 mW EIRP | | | | | 190 | mA |
| Average Receive Mode Current: | | | | | | |
| Base, Continuous Data Stream | | | | 139 | | mA |
| Remote, Linked, No Data | | | | 34 | | mA |
| Remote, Continuous Data Stream | | | | 44 | | mA |
| Nominal Dimensions | | | 3.3 x 3.2 x 1 inches (84.6 x 82.0 x 25.4 mm) | | | |
| Mounting | | | Left and Right Flanges, Two Pre-drilled Holes in Each Flange | | | |
| Operating Temperature Range | | | -40 | | 85 | °C |
| Operating Relative Humidity Range, Non-condensing | | | 10 | | 90 | % |

Discontinued

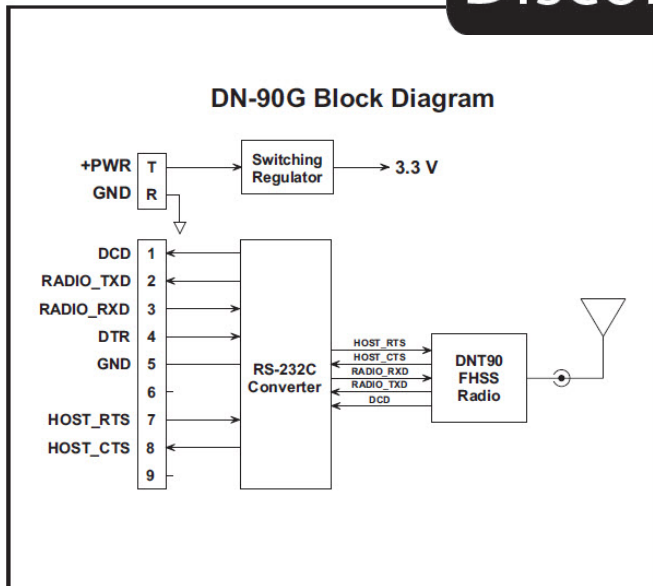


Figure 1

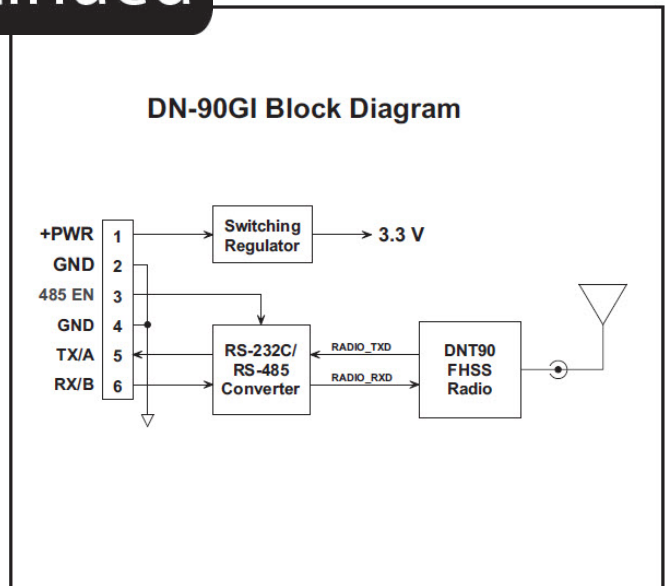


Figure 2

DN-90 Series Modem Operation

The DN-90 series 900 MHz modems provide a low cost, ready-to-use solution for robust wireless data communications in the 900 MHz ISM band. There are currently two products in the DN-90 series, the DN-90G and the DN-90GI. The DN-90G provides an RS-232C serial interface with optional hardware flow control. The DN-90GI offers a selectable RS-232C three-wire interface or a two-wire, multi-drop RS-485 interface. DN-90 series modems are based on RFM's DNT90 frequency hopping spread spectrum (FHSS) transceiver, and can communicate with other DNT90-based modems and sensor nodes, as well as customer developed products.

DN-90 series modems are supplied with a reverse SMA dipole antenna and a universal wall-plug power supply. DN-90 modems transmit data at 100 kbps. The transmitter output power can be set up to 100 mW EIRP using the supplied 2 dBi dipole antenna.

Optional high gain directional and omni-directional antennas are available from Murata to extend operating range where allowed by local regulations.

DN-90 series modems are well-suited for sensor and data networks carrying moderate traffic that need robust communications in locations with non-ideal RF propagation and/or where RF interference or noise are present.

As shown in the block diagrams above, data to and from a DN-90G are routed through an RS232C signal converter, and in the case of a DN-90GI are routed through an RS-232C/RS-485 signal converter. When terminal 3 is left unconnected on the DN-90GI, serial communication is 3-wire RS-232C. When terminal 3 is connected to terminal 2 or 4, serial communication is 2-wire, multi-drop capable RS-485.

The switching regulator used in all DN-90 modems supports a wide voltage range on the DC power input, from 9 to 24 Vdc.

DN-90 serial modems can operate in point-to-point, point-to-multipoint, peer-to-peer and store & forward DNT90-based wireless networks.

Discontinued

DN-90G Power Connector Description

| Ref | Name | I/O | Description |
|-----|------|-----|--|
| T | +PWR | I | The center coaxial conductor (tip) is the positive DC power input. |
| R | GND | - | The outer coaxial conductor (ring) is the DC power ground. |

DN-90G Serial Port Connector Description

| Pin | Name | I/O | Description |
|-----|-----------|-----|--|
| 1 | DCD | O | This pin is an output indicating the modem is linked to the radio network. |
| 2 | RADIO_TXD | O | This pin is the DN-90G serial data output. |
| 3 | RADIO_RXD | I | This pin is the DN-90G serial data input. |
| 4 | DTR | I | This pin is the data terminal ready input from the DN-90G host. |
| 5 | GND | - | This pin is signal ground. |
| 6 | - | - | No connection. |
| 7 | HOST_RTS | I | This pin is the request to send input from the DN-90G host. |
| 8 | HOST_CTS | O | This pin is the clear to send output from the DN-90G. |
| 9 | - | - | No connection. |

DN-90GI DC Power/Serial Port Terminal Block Description

| Pin | Name | I/O | Description |
|-----|--------|-----|--|
| 1 | +PWR | I | This terminal is the positive power supply input, +9 to +24 V. |
| 2 | GND | - | This terminal is a power supply and signal ground. |
| 3 | 485 EN | I | When this terminal is unconnected, serial operation is RS-232C. When this terminal is grounded to terminal 2 or 4, serial operation is RS-485. |
| 4 | GND | - | This terminal is a power supply and signal ground. |
| 5 | TX/A | O | This terminal transmits data to the host (RS-232C TxD or RS-485 A signal). |
| 6 | RX/B | I | This terminal receives data from the host (RS-232C RxD or RS-485 B signal). |

DN-90G/GI LED Indicator Description

| Ref | Name | I/O | Description |
|-----|----------|-----|---|
| 1 | ACTIVITY | O | Left-most LED on the front of the unit, amber, indicates RF communications activity. |
| 2 | LINK | O | Middle LED on the front of the unit, red. On a base, this LED indicates one or more remotes are linked to it. On a remote, this LED indicates it is linked to the base. |
| 3 | POWER | O | Right-most LED on the front of the unit, green, indicates the unit is powered up. |

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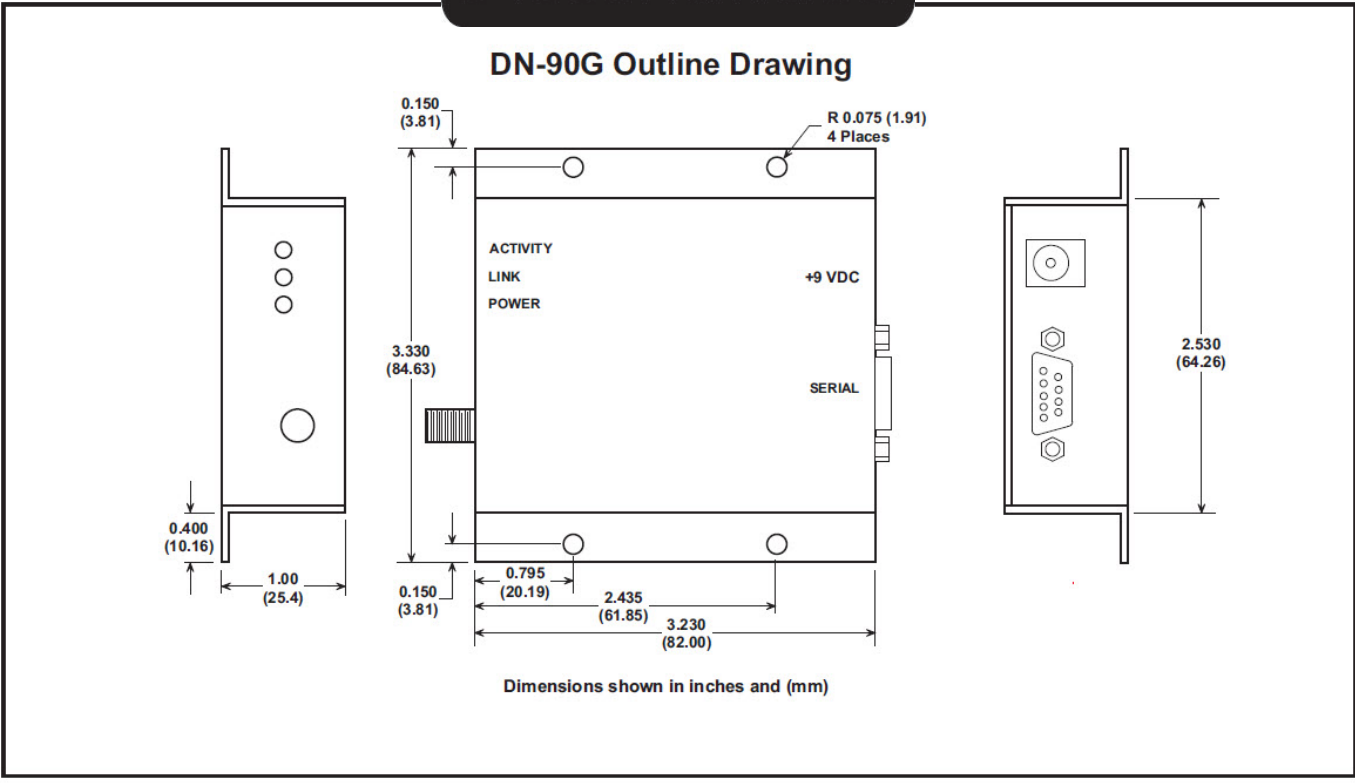


Figure 3

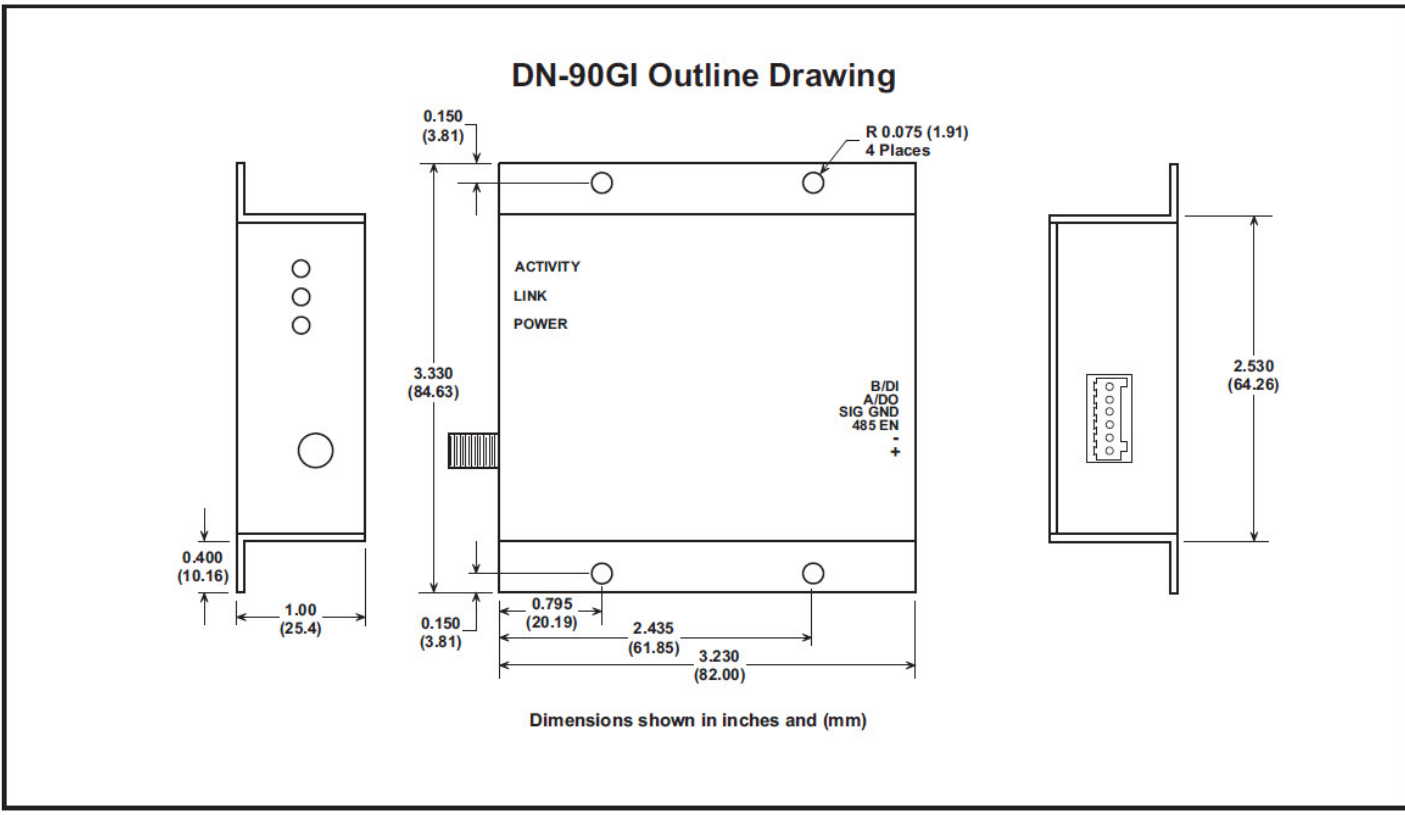


Figure 4

Note: Specifications subject to change without notice.