

SN90R420

- **Wireless Sensor Node for RTD, 4-20 mA and Contact Inputs**
- **Supports 2, 3 or 4-wire 100 ohm Platinum RTDs**
- **Robust 900 MHz FHSS Radio**
- **Internal Antenna or External 2 dBi Antenna Options**
- **Optional 128-Bit AES Encryption**
- **Compatible with LG90E and LG90C Gateways**
- **Configuration Through Serial Port**
- **Up to 10 Years Battery Life**

900 MHz RTD/4-20 mA Sensor Node

The SN90R420 is a battery-powered wireless sensor node providing support for one 100 ohm Platinum RTD, one 4-20 mA input and one contact closure input. Wireless connectivity is provided through a 158 mW 900 MHz Frequency Hopping Spread Spectrum (FHSS) wireless connection, making use of the companion LG90E Ethernet gateway or LG90C cellular gateway. The unique low-power DNT90 FHSS radio and signal conditioning circuitry used in the SN90R420 provide years of battery operation. Sensor data plus battery status is automatically transmitted based on user-configurable conditions, simplifying application software design. The wireless sensor node is configured through its serial port.



SN90R420 Specifications

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Sensor Inputs			2, 3 or 4-wire 100 ohm Platinum RTD 4-20 mA Contact Closure			
RTD Type			100 ohm Platinum, 0.00385 Alpha			
RTD Temperature Range			-200		+158	°C
RTD Resolution				0.0625		°C
RTD Accuracy				±0.3		°C
RTD Measurement Data Format			16-bit Signed Value			
4-20 mA Measurement Resolution				12		bits
4-20 mA Measurement Data Format			12-bit Unsigned Value			
Open Contact Voltage				3.3		V
Closed Contact Current				33		µA
Contact Status Data Format			8-bit Unsigned Value			
Internal Battery Voltage Range			3.0		3.6	V
Internal Battery Voltage Accuracy					±2	%
Internal Battery Voltage Data Format			12-bit Unsigned Value			

SN90R420 Specifications

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Serial Interface			RS232C, 38.4 kbps, 8N1, no flow control			
Radio			RFM DNT90 FHSS Radio			
Operating Frequency Range			902.76		927.24	MHz
RF Data Rate			100			kbps
Number of RF Channels			25, 26 or 52			
RF Transmit Power			40 or 158			mW
Receiver Sensitivity, 10E-5 BER:				-100		dBm
Internal Antenna			SMD Chip Antenna			
Optional External Antenna			2 dBi RPSMA Dipole Antenna			
Supplied Battery			Lithium Thionyl Chloride (LTC) C Cell, 8.5 A-hr			
Operating LTC Battery Life, -40 to +85 °C:						
1 Minute Report Interval				1.5		years
15 Minute Reprt Interval				10*		years
1 Hour Report Interval				10*		years
Optional Battery			3 Alkaline AA Cells, 2.5 A-hr			
Operating Alkaline Battery Life, -20 to +50 °C:						
1 Minute Report Interval				4.5		months
15 Minute Reprt Interval				2.8		years
1 Hour Report Interval				4.2		years
Sensor Sampling Rate					2000	Hz
Report Triggers:						
Timer			100 ms to > 1 year			
Measurement Value			High and Low Measurement Thresholds			
Switch Closure			Upon Closure			
Operating Temperature Range			-40		+85	°C
Operating Humidity Range, Non-condensing			5		95	%RH
Nominal Dimensions			5.5 x 2.5 x 1.3 inches 140 x 64 x 33 mm			
Mounting			Left and Right Flanges, Two Pre-drilled Holes Plus Slot in Each Flange			

*LTC battery life specified by manufacturer is 10 years. Operation with 15 minute and 1 hour report intervals does not consume rated battery capacity during 10 years of operation.

SN90R420 Block Diagram

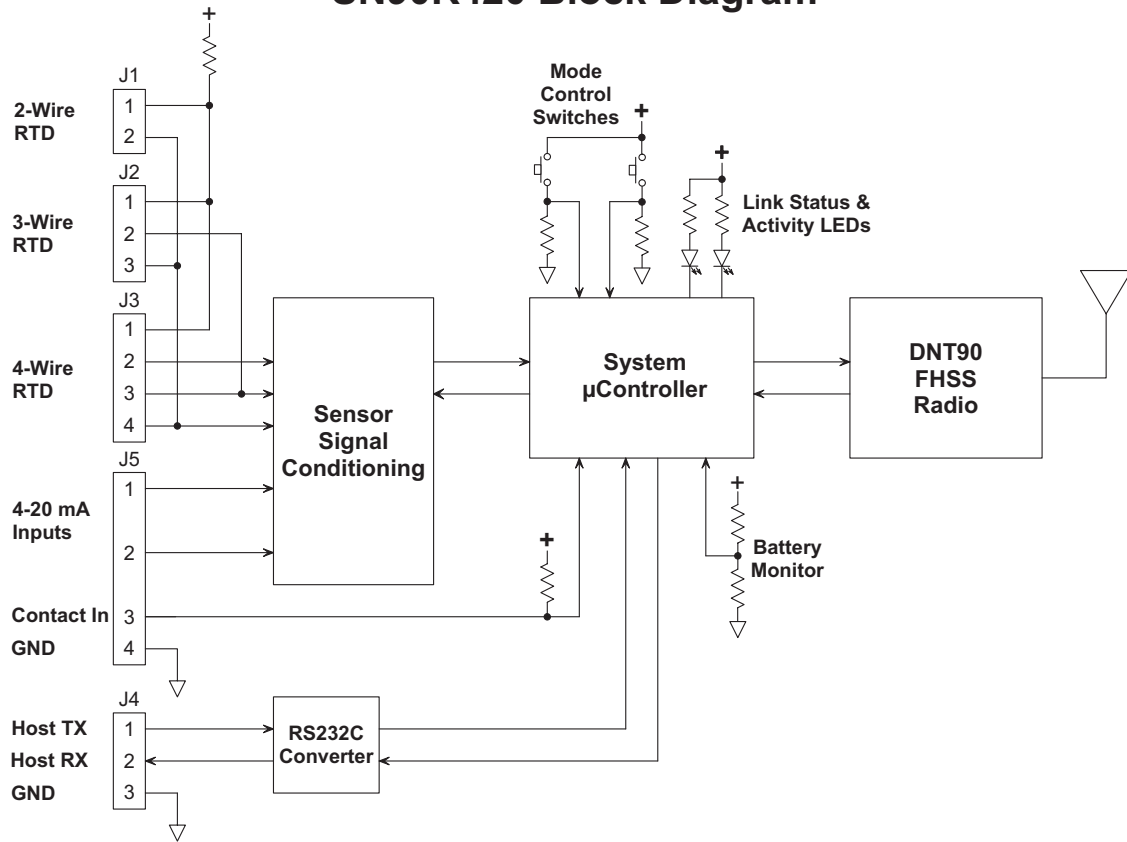


Figure 1

SN90R420 Operation

The SN90R420 is a 900 MHz Frequency Hopping Spread Spectrum (FHSS) based wireless sensor node. The SN90R420 supports 100 ohm platinum RTD, 4-20 mA and switch closure inputs. The SN90R420's very low average power consumption provides up to 10 years of operation from a 8.5 A-hr C cell LTC battery. Alternately, the SN90R420 can be powered from three inexpensive AA batteries in limited temperature range applications where shorter battery operating life is acceptable.

The SN90R420 sensor node is available with either an internal antenna or external 2 dBi dipole antenna.

The SN90R420 includes two LED indicators and two buttons to facilitate installation, activation, configuration and testing.

J1, J2 and J3 provide connection points for 2, 3 or 4-wire RTDs respectively, with a 4-wire RTD preferred for best accuracy. J4 provides connection points for 3-wire RS232 communication with a host computer, and J5 provides connection points for the 4-20 mA and contact status inputs.

The SN90R420 automatically reports the sensor input readings on user defined intervals and conditions, eliminating the need for application polling. When the SN90R420 sends data, it wakes up, synchronizes with its gateway, transmits the data and quickly returns to sleep, maximizing battery life.

The internal battery voltage is included in each sensor report, providing continual information on the battery status. The SN90R420 is configured through its serial port using a standard 3-wire RS-232 connection.

Connector J1 Description

Pin	Name	I/O	Description
1	RTD+	I	2-wire RTD positive (red) input. This input is connected to the RTD current source.
2	RTD-	I	2-wire RTD negative (black) input. This input is connected to the RTD ground return.

Connector J2 Description

Pin	Name	I/O	Description
1	RTD+	I	3-wire RTD positive (red) input. This input is connected to the RTD current source.
2	RTD-	I	First 3-wire RTD negative (black) input. This input is connected to the ADC negative differential input.
3	RTD-	I	Second 3-wire RTD negative (black) input. This input is connected to the RTD ground return.

Connector J3 Description

Ref	Name	I/O	Description
1	RTD+	I	First 4-wire RTD positive (red) input. This input is connected to the RTD current source.
2	RTD+	I	Second 4-wire RTD positive (red) input. This input is connected to the ADC positive differential input. If a 2-wire RTD is being used on J1 or a 3-wire RTD is being used on 2, jumper this input to J3 terminal 1.
3	RTD-	I	First 4-wire RTD negative (black) input. This input is connected to the ADC negative differential input. If a 2-wire RTD is being used on J1, jumper this input to J3 terminal 4.
4	RTD-	I	Second 4-wire RTD negative (black) input. This input is connected to the RTD ground return.

Connector J4 Description

Ref	Name	I/O	Description
1	HOST TX	I	Input terminal for host RS232 TX.
2	HOST RX	O	Output terminal for host RS232 RX.
3	GND	-	RS232 ground terminal.

Connector J5 Description

Ref	Name	I/O	Description
1	4-20+	I	Positive 4-20 mA input.
2	4-20-	I	Negative 4-20 mA input.
3	CONTACT	I	Contact input. This terminal is connected to +3.3 V through a 100 K resistor.
4	GND	-	Contact ground terminal.

SN90R420 Case Dimensions

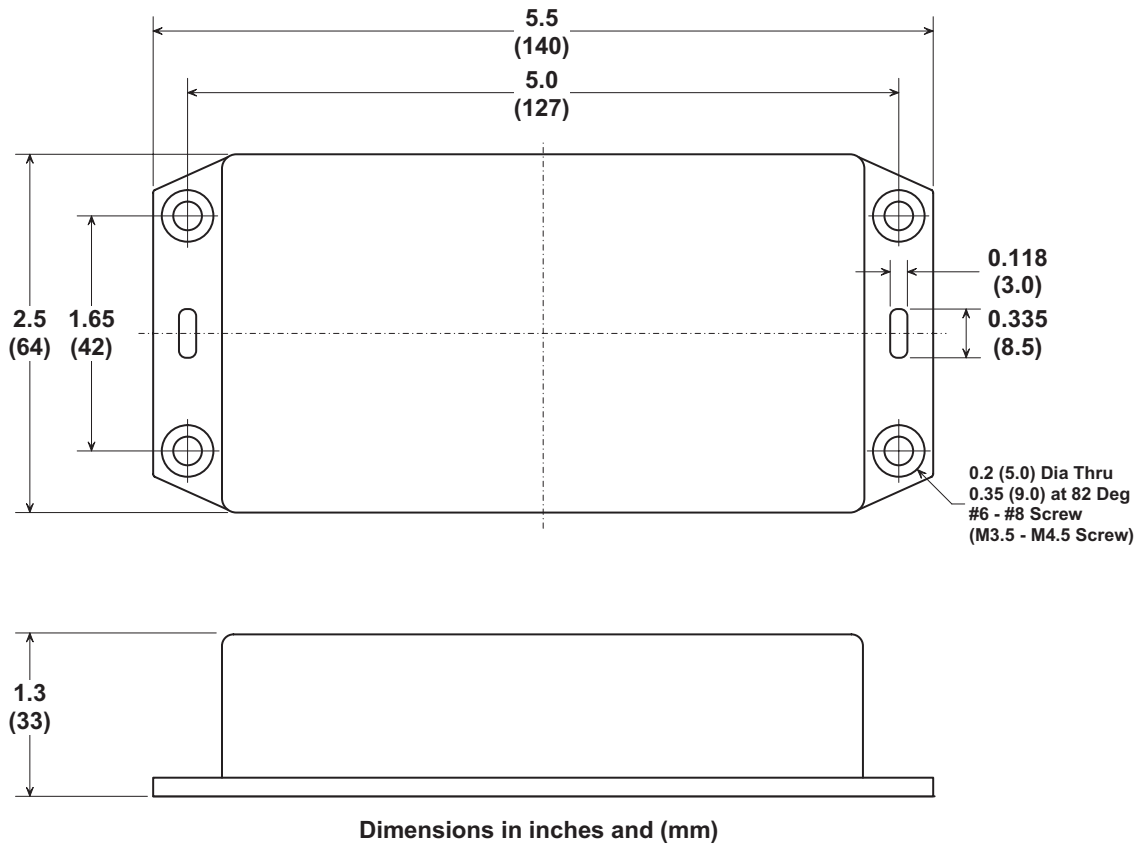


Figure 2

Note: Specifications subject to change without notice.

Part # M-0090-4000, Rev A