

SN90RC-4

4-Channel RTD/CT Wireless Sensor Node

- 4 Analog Channel, Battery Powered Wireless Sensor Node
- 2 RTD Inputs and 2 Current Transformer Inputs Plus 2 Switch Inputs
- Supports 2- and 3-Wire 100 ohm Platinum RTDs
- True RMS Current Measurement
- Switch State and Change-of-State Monitoring
- Non-volatile Data Logging Memory
- Robust 900 MHz FHSS DNT90 Radio
- Internal Antenna or External 2 dBi Antenna Options
- Optional 128-Bit AES Encryption
- Compatible with LG90E and LG90C Gateways
- Configuration Over-the-Air or Through the Serial Port
- Up to 5 Years of Battery Life
- FCC and Canadian IC Certified for Unlicensed Operation

The SN90RC-4 is a battery-powered wireless sensor node that provides support for two 100 ohm Platinum RTD inputs, two current transformer inputs and two switch inputs (many other sensor configurations are available, contact Murata for details). Connectivity is provided through a 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 architecture used in the SN90RC-4 provides years of battery operation. Sensor data and battery status are automatically transmitted based on user-configurable conditions, simplifying application software design. The wireless sensor node can be configured over-the-air or through its serial port.



SN90RC-4 Specifications

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Sensor Inputs			2- or 3-wire 100 ohm Platinum RTDs Current Transformers Contact Closures			
RTD Type			100 ohm Platinum, 0.00385 Alpha			
RTD Temperature Range			-200		+600	°C
RTD Resolution				0.0625		°C
RTD Accuracy				±0.3		°C
RTD Measurement Data Format			16-bit Signed Value			
Input Range for Current Transformer			0		3.34	mA _{RMS}
Current Measurement Resolution				16		bits
Current Measurement Accuracy					±2	%
Current Measurement Data Format			16-bit Unsigned Value			
Open Contact Voltage				3.3		V
Closed Contact Current				33		µA
Contact Status Data Format			8-bit Unsigned Value			

SN90RC-4 Specifications

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Internal Battery Voltage Range			3.0		3.6	V
Internal Battery Voltage Accuracy					±2	%
Internal Battery Voltage Data Format			16-bit Unsigned Value			
Serial Interface			RS232C, 38.4 kbps, 8N1, no flow control			
Radio			Murata 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, EIRP, Chip Antenna			40 or 158			mW
RF Transmit Power, EIRP, 2 dBi Antenna			63 or 250			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 Report Interval				5		years
1 Hour Report Interval				5		years
Optional Battery			3 Alkaline AA Cells, 2.5 A-hr			
Operating Alkaline Battery Life, -20 to +50 °C:						
1 Minute Report Interval				0.4		years
15 Minute Report Interval				2+		years
1 Hour Report Interval				3+		years
Report Triggers:						
Timer			100 ms to > 1 year			
Measurement Value			High and Low Measurement Thresholds (channels are individually programmable)			
Switch Input			Switch Opening Event, Switch Closing Event, or Both Events			
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			

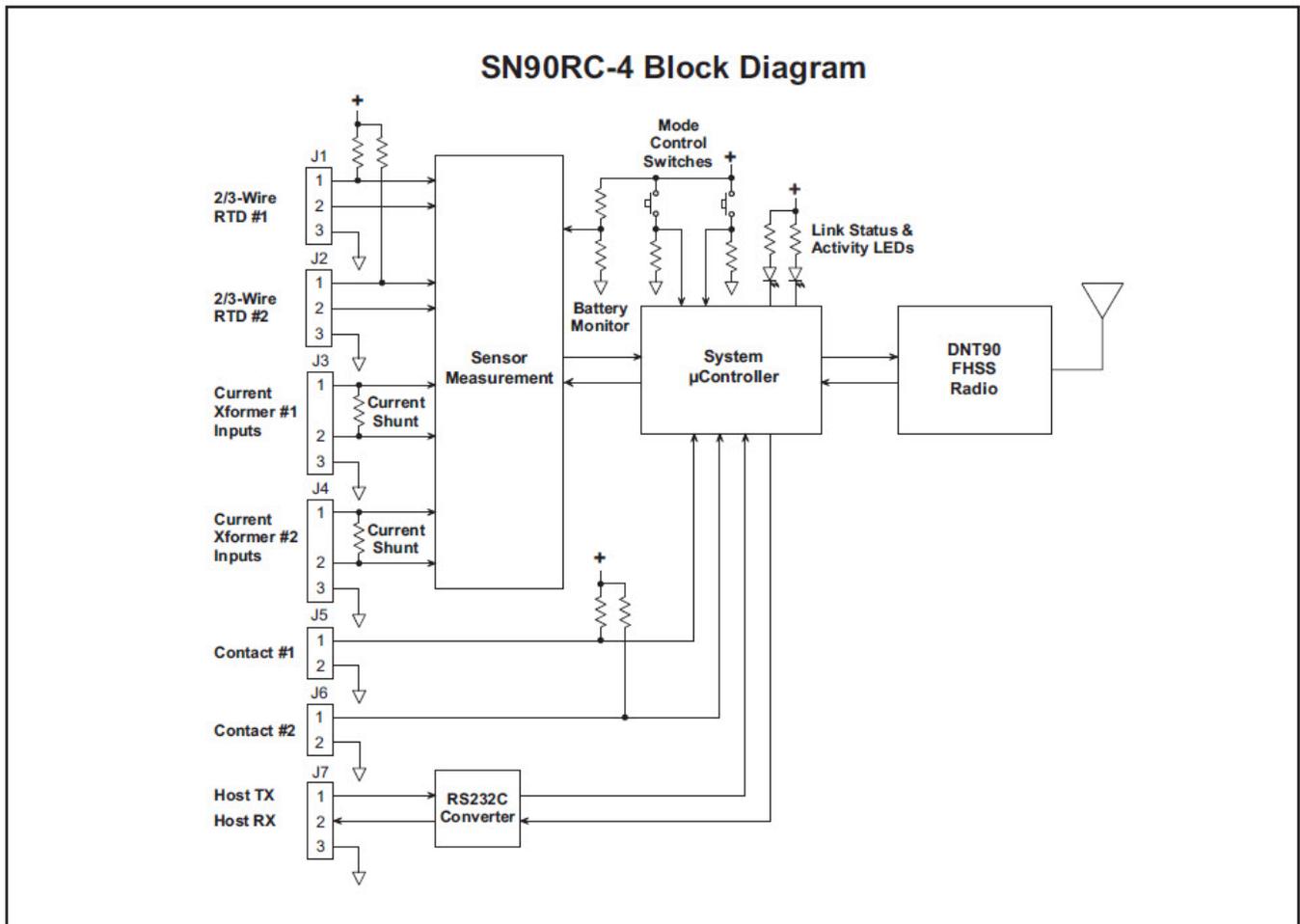


Figure 1

SN90RC-4 Operation

The SN90RC-4 is a 900 MHz FHSS-based wireless sensor node that supports two 100 ohm platinum RTD inputs, two current transformer inputs and two switch closure inputs. The SN90RC-4 includes internal storage for more than 1500 time-stamped sets of readings, where each set includes the four analog channels and the two switch inputs. The SN90RC-4's very low average power consumption provides up to five years of operation from a 8.5 A-hr C cell LTC battery. Alternately, the SN90RC-4 can be powered from three inexpensive AA batteries in limited temperature range applications where shorter battery operating life is acceptable.

The SN90RC-4 wireless sensor node is available with either an internal antenna or an external 2 dBi dipole antenna.

The SN90RC-4 includes two LED indicators and two buttons to facilitate installation, activation, configuration and testing.

As shown in Figure 1, J1 and J2 provide connection points for 2- or 3-wire RTDs. J3 and J4 provide connection points for current transformer inputs. J5 and J6 provide connection points for contact status inputs, with J7 providing connection points for 3-wire RS232 communication with a host computer.

The SN90RC-4 automatically reports the sensor input readings on user-defined intervals and conditions, eliminating the need for application polling. When the SN90RC-4 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 SN90RC-4 can be configured over-the-air, or through its serial port using a standard 3-wire RS-232 connection.

Connector J1 and J2 Description, 2- or 3-Wire RTD Input

Pin	Name	I/O	Description
1	RTD+	I	3-wire RTD positive (red) input. This input is connected to the RTD current source and the ADC positive differential input.
2	RTD-	I	First 3-wire RTD negative (black) input. This input is connected to the ADC negative differential input. This input is not used with a 2-wire RTD.
3	RTD-/GND	I	Second 3-wire RTD negative (black) input or 2-wire RTD negative input. This input is connected to the RTD ground return.

Connector J3 and J4 Description, Current Transformer Input

Ref	Name	I/O	Description
1	CURRENT 1	I	First current transformer input. There is a 300 ohm current shunt between this terminal and terminal 2.
2	CURRENT 2	I	Second current transformer input.
3	GND	-	Ground terminal.

Connector J5 and J6 Description, Contact Input

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

Connector J7 Description, 3-Wire RS232

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.

SN90RC-4 Case Dimensions

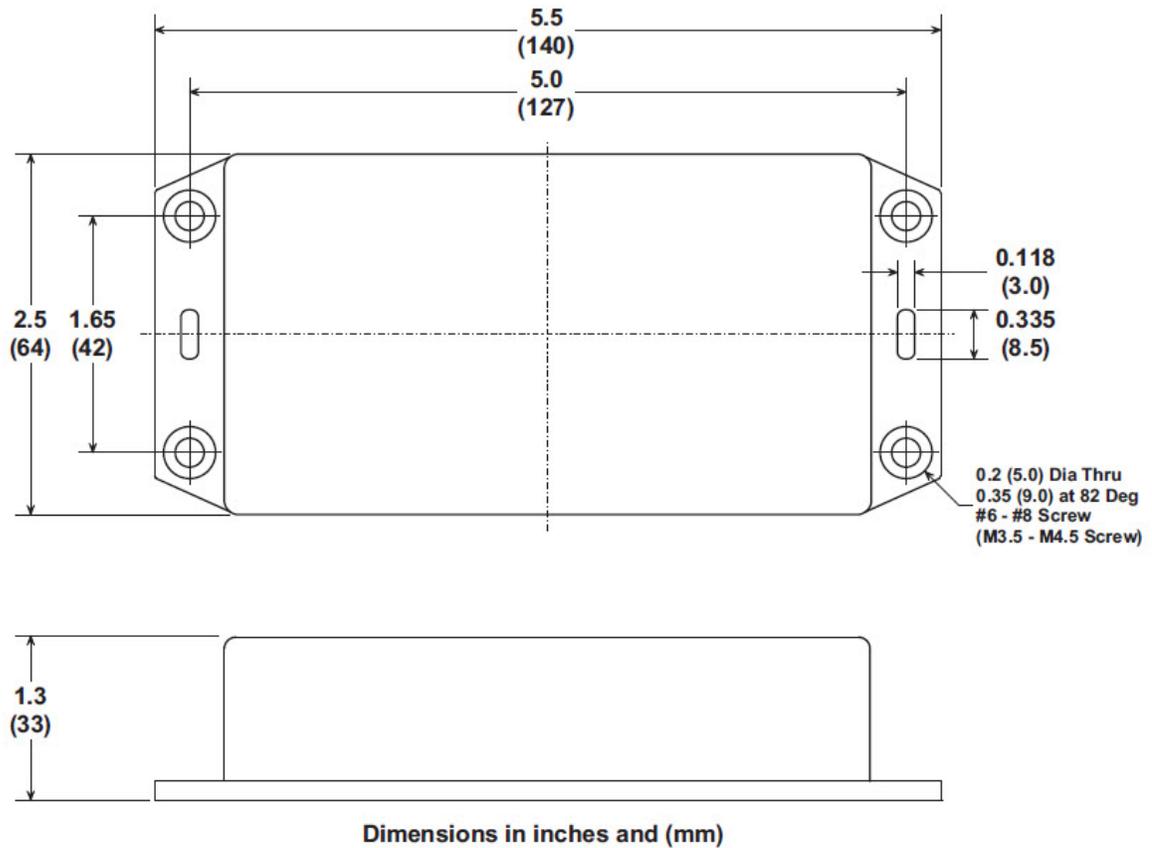


Figure 2

Note: Specifications subject to change without notice.