

# NL-RF1000 UHF RFID Reader

## Hardware User's Manual

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August 2009



[www.nesslab.com](http://www.nesslab.com)

**WARNING** This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. The sale person or the user wishes, paying attention to this piece, uses from the area of the residence outside the fact that in goal.

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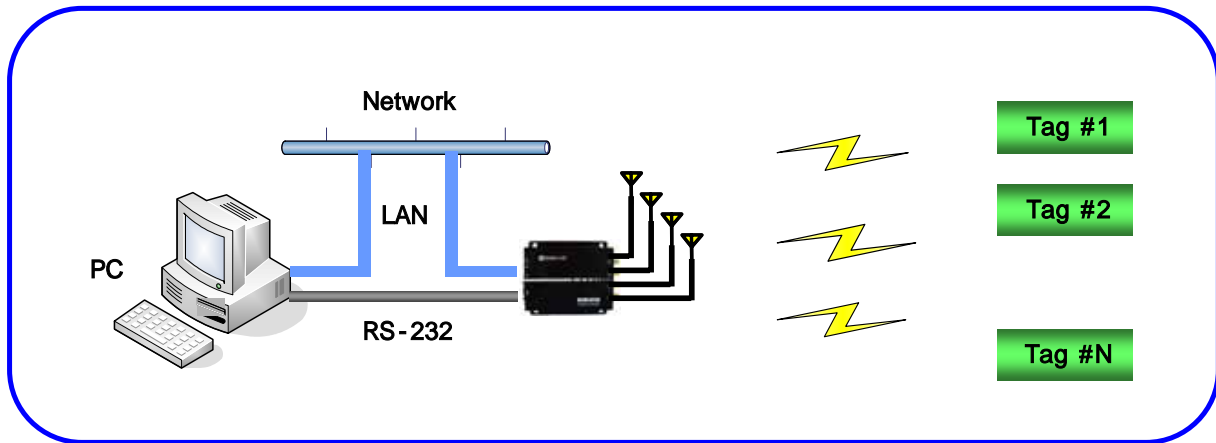
# 1. INTRODUCTION

## 1.1 Overview

NL-RF1000 is a Fixed Type 900MHz RFID Reader, enables user to use RS232 or Ethernet Interface for efficient and convenient use. It is suitable for various applications such as Logistic, Asset tracking, Stock management, Parking lot management, Healthcare, Security, Transportation and bank system.

User can use up to 4 antennas per one reader, perfect for wide range reading application than longer distance reading application.

### System configuration



## 1.2 Composition



Reader main body



Antenna



DC5V/4A adapter



Antenna cable (6m)



RS-232 Cable



Instruction

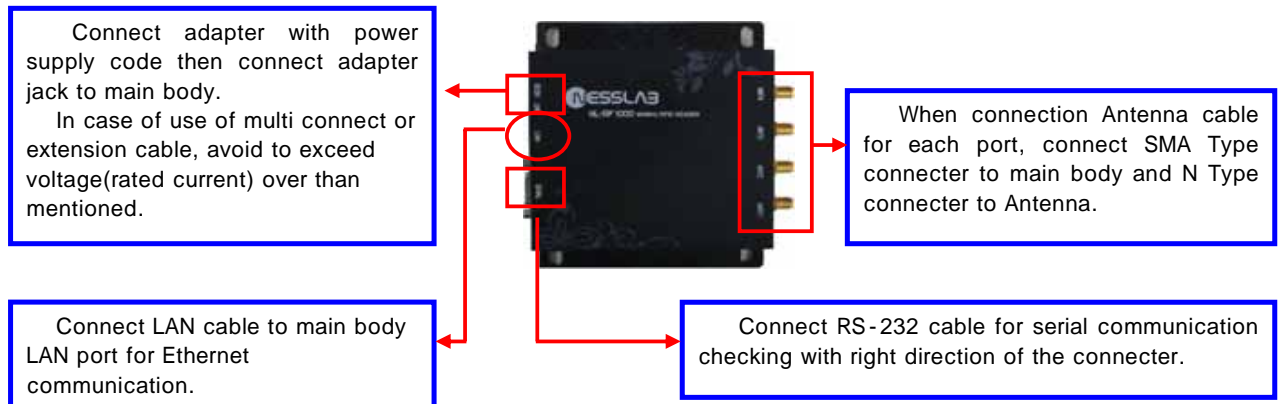
### 1.3 Reader Configuration



## 1.4 Reader Installation

### How to install or connect reader with antenna

1. Make the reader stay still.
2. Connect each cable in the package.

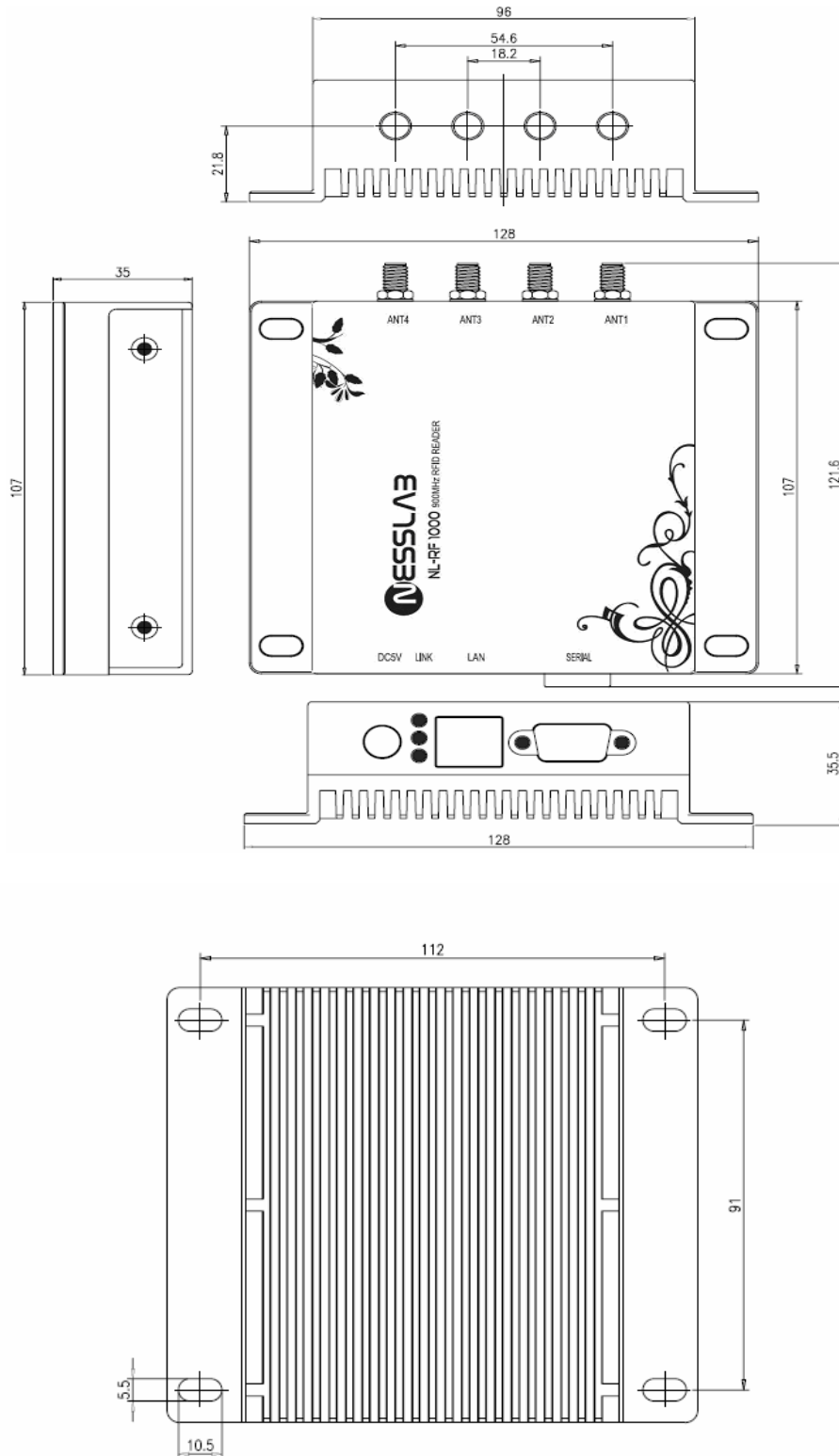


### How to install antenna correctly

1. Avoid metal material the front side of antenna in 2M due to cause of low performance.
2. Make the antenna stay still.
3. Antenna Cable per each ports should be not tangled and tied up.

## 1.5 Reader Physical Size

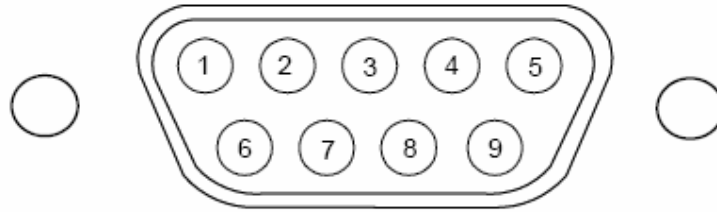
unit: mm



## 1.6 Specification

ITEM	SPECIFICATION
<b>Model Number</b>	NL-RF1000
<b>Operating Frequency</b>	902.75 MHz ~ 927.25 MHz
<b>RF Output Port</b>	4
<b>Hopping Channels</b>	50
<b>Channel Spacing</b>	500 KHz
<b>Channel Dwell Time</b>	< 0.4 seconds
<b>Modulation</b>	Phase Reversal-Amplitude Shift Keying (PR-ASK)
<b>RF Transmitter</b>	< 1W (30 dBm)
<b>Communication Interface</b>	RS-232 (DB-9F), TCP/IP (RJ-45)
<b>GPIO Support</b>	2-Input / 2-Output
<b>Dimensions</b>	107 x 98 x 32 mm
<b>Weight</b>	473g
<b>Operating Temperature</b>	-10 ~ +50
<b>LED Indicators</b>	Link, ACT, Power
<b>Power Consumption</b>	DC 5V Adaptor, 1.8A
<b>Protocols Support</b>	ISO 18000-6 Type C/ EPC Class1-Gen2
<b>Software Support</b>	Reader Manager (API)
<b>Compliance Certifications</b>	NES-NL-RF1000

## 1.7 RS-232 & GPIO Interface



Pin NO.	RS-232 Interface	GPIO Interface (Option)
1	Not Connected	Output 1
2	Transmit Data	Not Connected
3	Receive Data	Not Connected
4	Not Connected	Input 1
5	Ground	Ground
6	Not Connected	Output 2
7	Not Connected	Input 2
8	Not Connected	Input 3
9	Not Connected	Output 3



## 2. Antenna

### 2.2.1 Scope

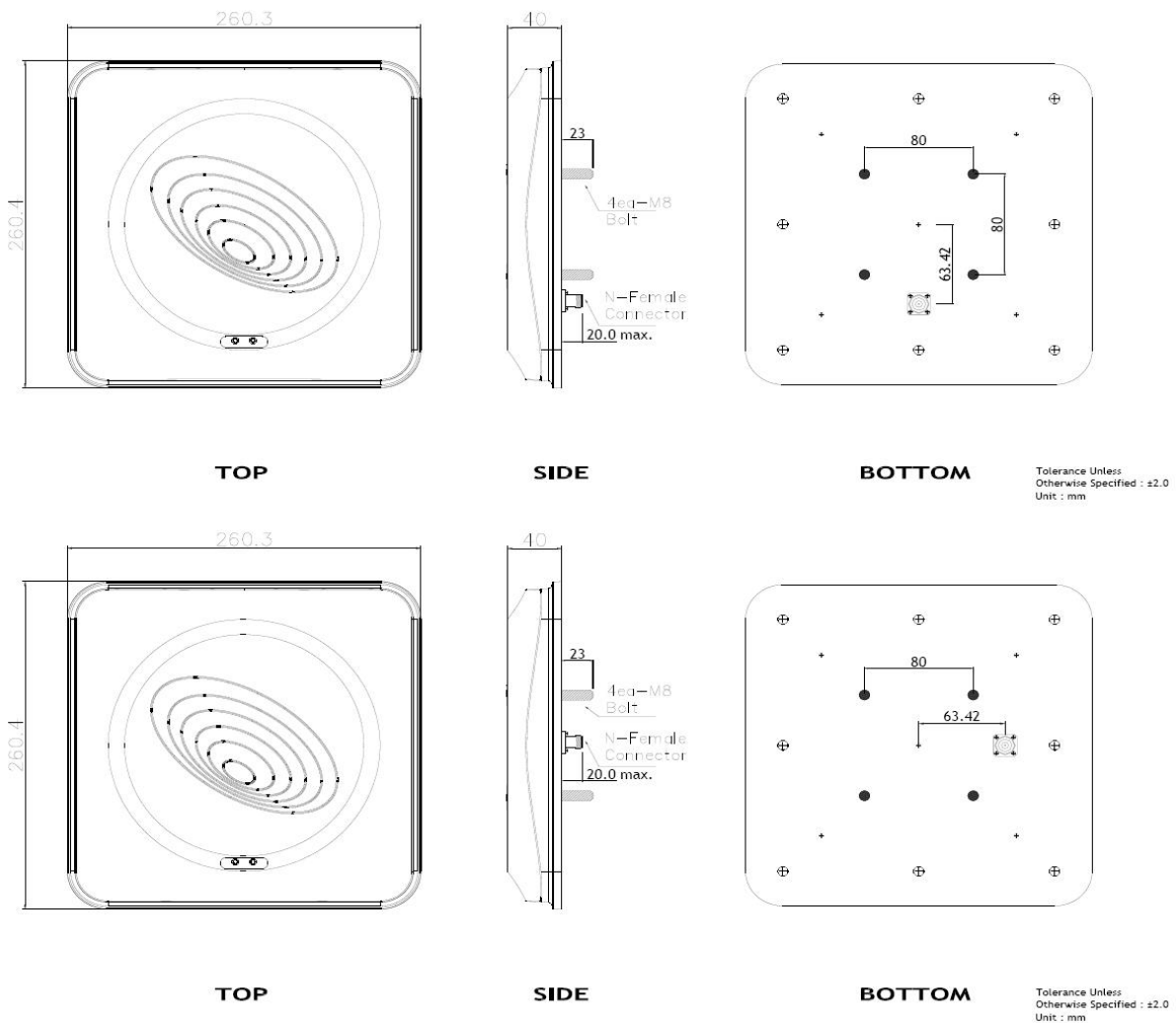
This specification covers the characteristics of the ceramic patch antenna element for the ISM band

### 2.2.2 Composition and Materials.

1. Substrate : Air & Insulator
2. Electrode Plating : Copper & Aluminum
3. Terminal pin : Heat-resisting ABS

### 2.2.3 Mechanical Dimensions.

unit: mm



## 2.4. Electrical specifications.

NO.	Parameters	Spec.	Typical value	Unit	Remark
1	Center Frequency	919		MHz	
2	Band Width @ - 10 dB R.L.	60 min.	80	MHz	
3	VSWR	2.0 : 1 max.	1.1 : 1	Ratio	@919 MHz
4	Gain @ Zenith	5.0 min.	5.0~6.0	dBiL	@919 MHz
5	Axial Ratio	3.0	1.5~2.0	dB	@919 MHz
6	Impedance		50	Ohms	
7	Polarization	RHCP			

### 3. FCC Information to User

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

- (1) the device may not cause interference, and
- (2) the device must accept any interference, including interference that may cause undesired operation of this device.

### 4. WARNING TO USER

- Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.
- This equipment must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for uncontrolled equipment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment must be installed and operated with at least 20cm and more between the radiator and person's body (excluding extremities: hands, wrists, feet and ankles).