

# RN-001-HP(S)



## Radionode Stand-Alone Monitoring Gateway

- ✓ **Emailing Temp/RH Daily Report**
- ✓ **Sending Alert SMS Message to User**
- ✓ **Sending Alert Twitter Direct Message**
- ✓ **Easy Configuration**
- ✓ **Connecting Up to 8 Wireless Sensor**
- ✓ **Supporting Remote Monitoring.**



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### Overview

RN-001-HP(S) is designed for small facility to collect temperature and humidity in efficient way. A separate server or PC is not required due to built-in software to notify data to users.

In other words, It has an ability to send e-mail report with attached raw data file to user. Also it has an alert message sent functionality through the SMS or Twitter

Direct Message by itself.

Besides, RN001-HP(S) can give us a remote real time monitoring feature for temperature and humidity using Xively / Exosite web service. Xively/Exosite is a secure, scalable monitoring platform that connects device with application to provide web monitoring.

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### Application

- Data logger
- SMS Alert Message for Temp./RH
- Twitter Message for Temp./RH
- E-mail Daily Summary Report
- Monitoring On PC and Mobile

### Block Diagram

### Where to Use

- Food Service
- Live Stock
- Warehouse
- Medical Industry
- Manufacturing Facility
- Server Room

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## 1. Product Summary

### 1.1 Hardware Specification

RN-001 Hardware Specification	
Dimension	73 * 116 * 25 (mm)
Power	6V DC
Wireless Network	Tree Topology
RF Frequency Range, Power	2.4 GHz , less than 10mW
Ethernet	100MBPS, TCP/UDP/HTTP
SDCARD slot	SDCARD Data Logger (CSV Format) ,4GB
USB Port	PC Connectivity
Console	RS-232C ( 57600 bps ), Test Port
Sending Interval	10 Minutes & 5 Minutes
Destination Server	SmsGlobal.com, Cafe24.com, Twitter.com, Xivley.com, radionode.exosite.com

### 1.2 Supported Web Service

RN-001 Supported Web Service	
SMS HOSTING SERVICE	SMSGLOBAL.COM
	SMS.CAFE24.COM
SNS MESSAGING SERVICE	TWITTER.COM
MONITORING SERVICE	XIVELY.COM, EXOSITE.COM
EMAIL SMTP SERVICE	MAIL..YAHOO.COM
	MAIL.NAVER.COM
	NATE.COM

### 1.3 Appearance

There are five LED lamps (Power, Comm., SDcard, RX, TX) on front panel. On the side Console (RS232C) Port, USB port, Ethernet port, power port and SD card interface are exist. Console port is only for test or service. Console cable is not given.

Using USB port, user can set up user's information such as email address, phone number and service account. USB is also used in updating a firmware.

All the data of measurement are logged on SD card. Data format is CSV that excel can open.



### 1.4 Package Contents

- SOHO Wireless Monitoring Gateway 1EA
- 2.4Ghz Antenna 1EA
- 6V Power Supply 1 EA
- USB Cable 1EA
- RADIONODE CD 1EA

## 2. Installation

### 2.1 Setup Hardware

Given power supply should be used in RN001-HP(S). Default IP configuration is DHCP ON (Auto IP setup). Specific IP configuration can be set with radionode manager software.

### 2.2 Check Initial Booting

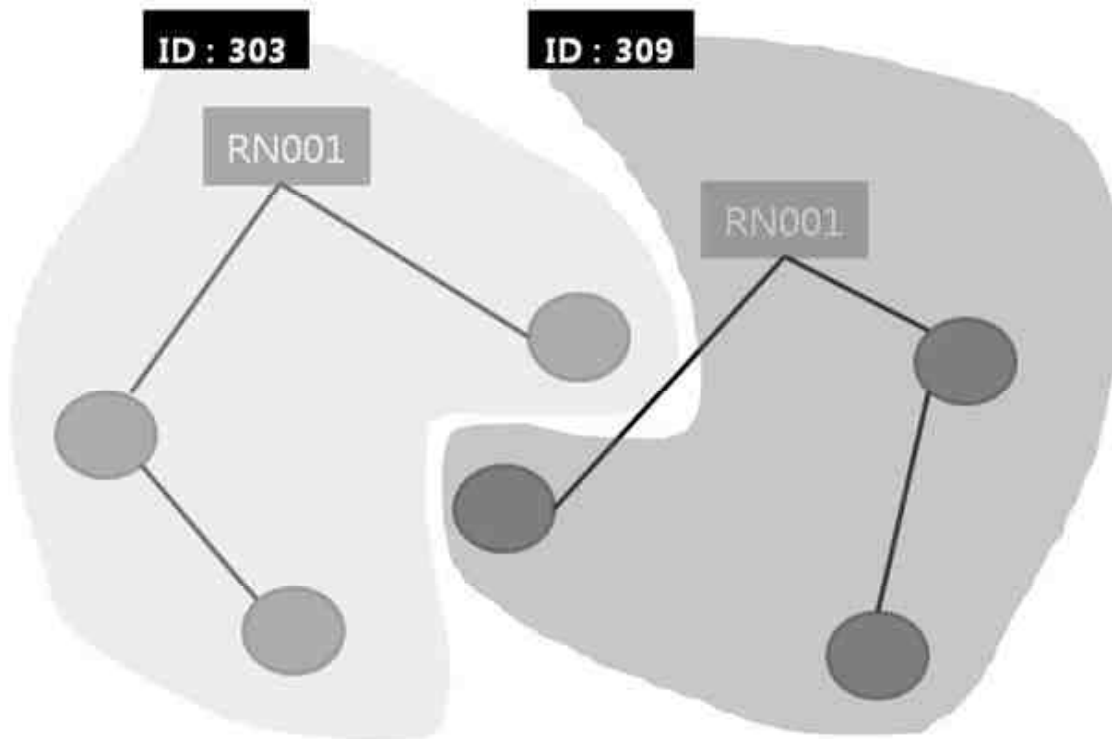
As soon as you connect the power, the power lamp and COMM lamp turn on. COMM LED lamp will be turned off when the time information is received from NTP server. If COMM LED lamp is still turned on, you need to check network configuration or network cable connection.

### 2.3 Add Wireless Temp./RH Sensor(RN300)

Registration of sensors is required before you use new wireless sensor (RN300). Radionode manager software can make it easier to put a use a defined name and MAC address on it. The MAC address is printed on the RN300.

### 2.4 Use Multiple Gateways.

There are two RN001-HP(S) devices in the same area. In this case radio frequency crosstalk can be happened. To avoid this crosstalk, the radionode devices can be grouped in unique network ID.



Wireless communication is not possible between devices that have the different network ID. Default network ID is 303. Radionode manager software is required for the devices to change network ID.

### 3. How to USE

#### 3.1 LED Indication



POWER	: Always ON while power cable is connecting.
COMM	: Off after getting NTP information. / Blink when USB connecting
SDCARD	: Blink when writing. / Keeping On when SD card full or error.
RX	: Blink when RF received.
TX	: Blink when Data is sending on LAN.

### 3.2 Use SD-CARD

Simply RN001-HP(S) can be used just like normal data logger using SD card. Up to 8 channel sensor data can be saved as a CSV file. The file name will represent year and month like 201206.csv. The file will be created once a month.

The data column sequence is Temperature of CH1, Humidity of CH1, Temperature of CH2, Humidity of CH2, ... lastly Humidity of CH8.

If remained data size is less than 10Mbyte, the gateway will stop writing and notify it to user once a day. In order to use SD card function, user should enable SDCARD through radionode manager software.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2012-06-25 14:18	30.52	50.34	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:23	30.54	50.43	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:36	30.74	50.18	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:41	30.75	50.11	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:46	30.75	50.37	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:54	30.81	50.18	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
2012-06-25 14:59	30.89	50.31	-----	-----	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx

■ "-----" : Sensor is registered but disconnected.

■ "xxx" : Sensor is not registered.

When you format SD card, file system should be FAT32 and 4096 byte. Quick format is not recommended.

RN001-HP(S) should be connected to internet in order to get time & date information from NTP. Otherwise There is no correct time & date for SD CARD



### 3.3 Use EMAIL Reporting

For Email reporting, SMTP account information is required. Up to three personnel can receive daily email report. The time to report is configurable parameter. Attached file RawData.csv have all the data during previous 24 hours.

On the report sheet, there are several configurable parameters such as name, sensor's name and time zone.

**Temperature / Humidity Daily Email Report**

• Device Information

-Name

LKJ World

-Time Zone

GMT + 9

-Date/Time

2012-06-25 19:05 ~ 2012-06-26 09:25

-Interval Time

05 Min.

-MAC Address

0004A312ED85

-Total Sensor

4

-IP Address

192.168.123.142

-Monitoring Device

Radionode RH-001

• 24 Hours Summary

CH	Name		Temperature(°C)		Humidity(%RH)		Signal(LQI)	Battery
1	LKJ-1 (E014001500000002)	Avg.	28.99		42.34		167	255
		Min.	28.46	[ 10.00]	40.67	[ 10.00]	120	-
		Max.	29.65	[ 28.00]	43.71	[ 30.00]	177	-
2	LKJ-2 (E014001500000003)	Avg.	28.83		43.27		181	255
		Min.	28.28	[ 10.00]	41.37	[ 10.00]	147	-
		Max.	29.66	[ 29.50]	44.68	[ 35.00]	186	-
3	LKJ-3 (E0140015000000021)	Avg.	28.72		41.29		172	255
		Min.	28.14	[ 10.00]	39.40	[ 10.00]	120	-
		Max.	29.55	[ 30.00]	42.71	[ 40.00]	174	-
4	LKJ-4 (E014001500000000E)	Avg.	28.72		42.05		190	255
		Min.	28.17	[ 10.00]	40.33	[ 10.00]	177	-
		Max.	29.47	[ 32.00]	43.42	[ 45.00]	198	-

[ 1 ] : Threshold Value For Alarm

Battery : 155 (Scale) ~ 5 (Full)

Signal (C/I) : Over 10 (Scale), Over 40 (Set Bat), Under 42 (Weak)

Attachment : Time, CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, CH9, CH10, CH11, CH12, CH13, CH14, CH15, CH16, CH17, CH18, CH19, CH20

RawData.csv

19K 다운로드

### 3.4 Setup SMS Message for Alert (Global)

SMS hosting service account should be registered in RN001-HP(S) for sending SMS alert message. The gateway supports msgglobal.com SMS web service. User need to put ID and PW of msgglobal.com service using radionode manager software.

Alert SMS message will be sent to registered phone numbers when event comes up. Up to three phone-numbers can be registered.

#### PREPARATIONS

1. Sign-in SMS hosting service and pay for it.
2. Register ID and password(or key) on the gateway.
3. Set threshold value for temp/RH and Enable SMS.

#### WHEN THRESHOLD MESSAGE SEND

1. Out of Temperature Threshold (Selective Unit of 10 Min)
2. Out of Humidity Threshold (Selective Unit of 10 Min)
3. Back to normal from abnormal (One Time right after restoration)

THRESHOLD MESSAGE FORMAT	
1.	[User Abnormal Message ] + ([Name of Sensor] : [Current Temperature])
2.	[User Abnormal Message ] + ([Name of Sensor] : [Current Humidity])
3.	[User Normal Message] + ([Name of Sensor] : [Current Temp.or Humidity])

WHEN SYSTEM MESSAGE SEND	
1.	Low battery of RN300 sensor (Selective Unit of an Hour)
2.	RN300 Sensor is disconnected. (Selective Unit of an Hour.)
3.	Remained storage of SD card is less than 10MB (Once a day)
4.	When resetting the gateway (Onetime right after power on)

SYSTEM MESSAGE FORMAT	
1.	LOW BATTERY! at [Name of Sensor]
2.	NO RF SIGNAL at [Name of Sensor]
3.	Radionode SDCARD is full at [Name of Site]
4.	Radionode RN001 is reboot at [Name of Site]

### 3.5 Setup Twitter Direct Message for Alert.

User can receive alert message through Twitter Direct Message as well as SMS. It is assume that User have been using an Iphone or Android phone. All the functions are same as SMS alert message. But there are a little difference like below.

WHAT IS DIFFERENT BETWEEN SMS and TWITTER DM	
1.	Twitter DM is free
2.	Twitter DM's destination is one person. (Self or Follower)
3.	Twitter DM is for people who using an iphone or android phone.
4.	Twitter DM has a count limitation. (250 a day )
5.	Twitter DM's context have a preamble text - [2 digit code]    ex>[e8]

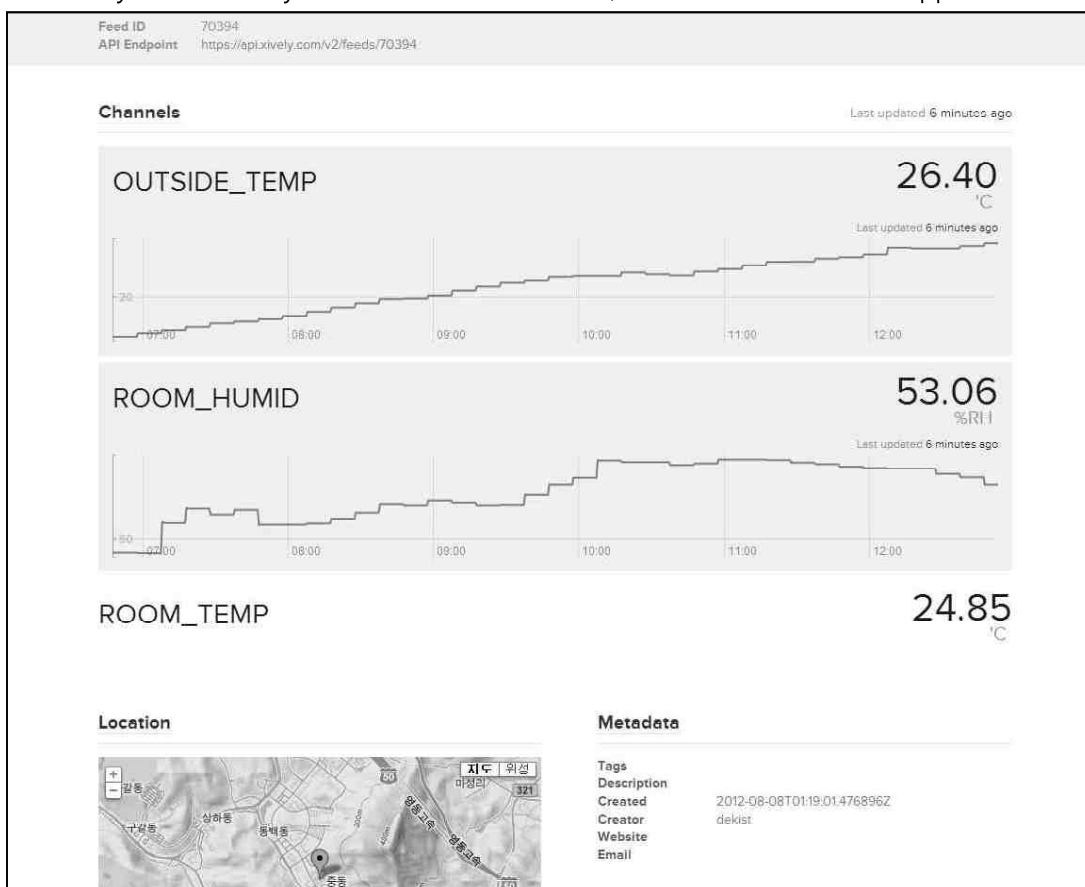
For Twitter usage, login and some security action should be processed with radionode manager software. All the user defined messages that twitter used are same as SMS alert messages.

### 3.6 Setup Xively Web Service (Web Monitoring)

RN001-HP(S) has embedded software that can access to XVIELY.COM. All the collected



information can be uploaded to XVIELY service. Once uploaded, User can access all the data with many different ways such as PC web browser, mobile web and other application.



### 3.7 Use Telnet

User can access the gateway system via telnet. Target IP address can be known on regular E-mail report or radionode manager software. You need to type "radionode114" on telnet terminal to access main menu when it is connected.

```
Radionode Gateway RN-001 Simple Telnet.  
Password:radionode114
```

You can view the temperature and humidity of each wireless sensor(RN300) on 1.SensorInfo Menu. Other nodes such as RN200 router, RN500 indicator are checked out on 2.NodeInfo Menu.

```
[MENU]1.SendorInfo, 2.NodeInfo, 3.ChInfoList, 4.RemoteReset, 9.Quit
1
SENSOR INFORMATION(RN300)
[No.][MAC][CHI][PAR][RXi][TXi][BATT.][Tempera.][Humidity][DewPoint]
[ 1][E0140015D00000002][ 0][ ff][168][183][ 255][ 29.58][ 40.98][ 14.92]
[ 2][E0140015D00000003][ 0][ 7][180][195][ 255][ 29.62][ 41.62][ 15.20]
[ 3][E0140015D00000021][ 0][ ff][171][186][ 255][ 29.47][ 39.56][ 14.28]
[ 4][E0140015D0000000E][ 0][ 7][189][204][ 255][ 29.39][ 40.61][ 14.62]
[ 5][0000000000000000][ 0][ 0][ 0][ 0][ 0][ 0.00][ 0.00][ 0.00]
[ 6][0000000000000000][ 0][ 0][ 0][ 0][ 0][ 0.00][ 0.00][ 0.00]
[ 7][0000000000000000][ 0][ 0][ 0][ 0][ 0][ 0.00][ 0.00][ 0.00]
[ 8][0000000000000000][ 0][ 0][ 0][ 0][ 0][ 0.00][ 0.00][ 0.00]
```

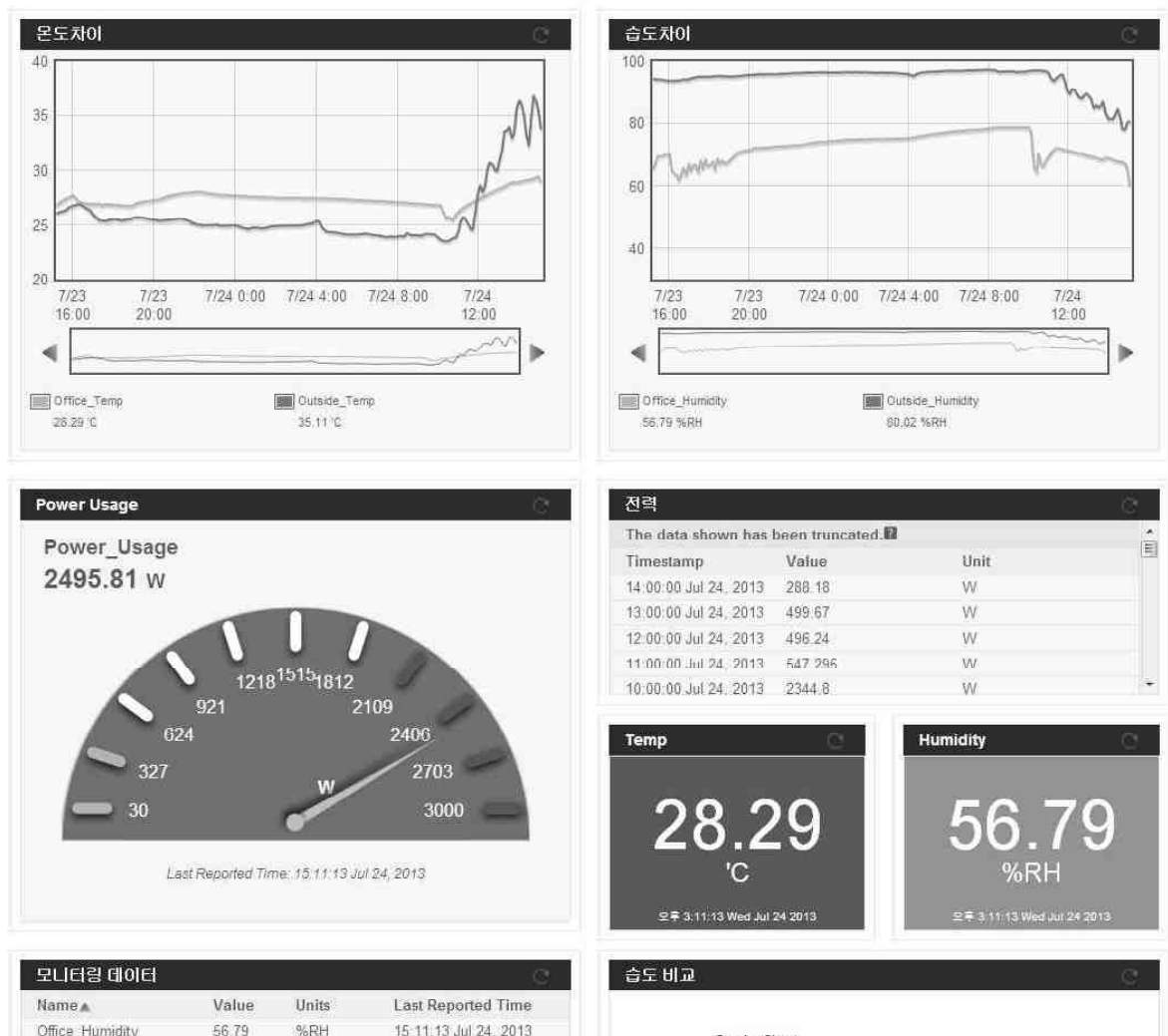
The gateway has all the measurement data in its own memory. When daily e-mail report with attached CSV file is sent, all the records are removed. You can view all the remained logging data on 3.ChInfoList Menu. If the value presents "999,00", that means no data.

```
[MENU]1.SendorInfo, 2.NodeInfo, 3.ChInfoList, 4.RemoteReset, 9.Quit
3
CHANNEL SELECTION( 1 ~ 8 )
1
DAILY SENSOR INFORMATION[CH 1]
[ # ][Data & Time][Tempera.][Humidity][LQI]
[ 0][2012-06-25 19:05][ 29.08][ 40.67][177]
[ 1][2012-06-25 19:10][ 29.15][ 40.97][174]
[ 2][2012-06-25 19:15][ 29.24][ 41.04][168]
[ 3][2012-06-25 19:20][ 29.33][ 41.03][168]
[ 4][2012-06-25 19:25][ 29.37][ 41.07][168]
[ 5][2012-06-25 19:30][ 29.43][ 41.00][168]
[ 6][2012-06-25 19:35][ 29.45][ 40.98][168]
[ 7][2012-06-25 19:40][ 29.48][ 40.98][171]
[ 8][2012-06-25 19:45][ 29.51][ 41.05][168]
[ 9][2012-06-25 19:50][ 29.54][ 41.02][168]
[10][2012-06-25 19:55][ 29.56][ 41.02][168]
```

### 3.8 Setup EXOSITE WEB DASH BOARD

RN001-HP(S) is also support Web Dash Board (radionode.exosite.com). This cloud web service is designed to create user configurable web dash board. Numbers, Graphs, Tables and so on. All the data are stored on the cloud during 30 days.

Below images represent demo web dash board which has two Rn300 temperature and humidity sensors and one power usages data coming from RN910 devices.



## 4. Trouble shooting

### 4.1 Firmware Update

Given firmware file from Dekist Co. Ltd. Should be used. Below procedure are observed.

1. USB thumb memory is FAT32.
2. Given file "image.hex" is saved in USB thumb memory without folder.
3. Put the USB thumb memory into USB port of the gateway.
4. Turn on the gateway and wait for a while.
5. TX LED is blinking. After a while COMM. LED is ON.

6. Firmware update is done.

#### 4.2 Only USB Power

RN001-HP(S) can be operating normally without power supplier. But there are bad symptoms when you use power from USB port only.

1. Reboot due to shortage of power current in case of SD card inserting.
2. Parameters are not saved while manager software is using due to shortage of power current.

#### 4.3 Certification & Warranty

- 1 Year Warranty Service for free
- Certification Information



National Radio Research Agency in Republic of Korea  
KCC-CMM-DeK-RN-001-HP (A)

#### 4.4 Contact

- Company : DEKIST Co., Ltd.
- Address : #303, 465-1 Gimryangjang-dong, Cheoin-gu, Gyeonggi-do, Korea
- Phone : +82 70-7529-4359
- Fax : +82 505-115-0009
- Email : master@dekist.com
- Web Page : www.radionode.co.kr

### 5. FCC Verification

Class A digital device

NOTE: 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.

CAUTION : Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

FCC RF Exposure Requirements: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.