1. Summary

This document is mainly for illustrating NTC Temperature Acquisition System based on RF-2410M Control briefly. Control the NTC working by RF-2410M. Transfer the collected data to RF-2410U via RF wireless transmission and analyze them. Our company provides detailed data sheet, application guide, program downloader, PC software, after-sales service support, etc.

Attention:

1. **This document only provides RF-2410M module application. For RF-2410U module's PC software detailed information, please visit www.inhaos.com. You may check "AN0004 RF-2410 Based Wireless Sensor Example Application" file.**

2. **This document adopts model NTC-103J-3435.If you want to purchase the item, please visit our eBay shop (http://stores.ebay.com/Electronic-in-house).**

2.   Temperature acquisition system architecture

This sample temperature acquisition system architecture mainly including: RF-2410M module, RF-2410Umodule, NTC sensor, program downloader, PC acquisition software, etc. NTC sensor collects temperature under the control of RF-2410M. Transfer the collected data to RF-2410U port via RF wireless transmission, and then transfer to PC via USB port to analyze and process the data.

## 2.1. NTC hardware structure based on RF-2410M control

(Figure 01 shows the typical application circuit of RF-2410M module and NTC sensor. NTC sensor operating voltage range is about 3.2V. we take an external 3.6V~4.2V lithium battery and provide for RF-2410M ,And then CON pin export 3.2V voltage to NTC sensor.
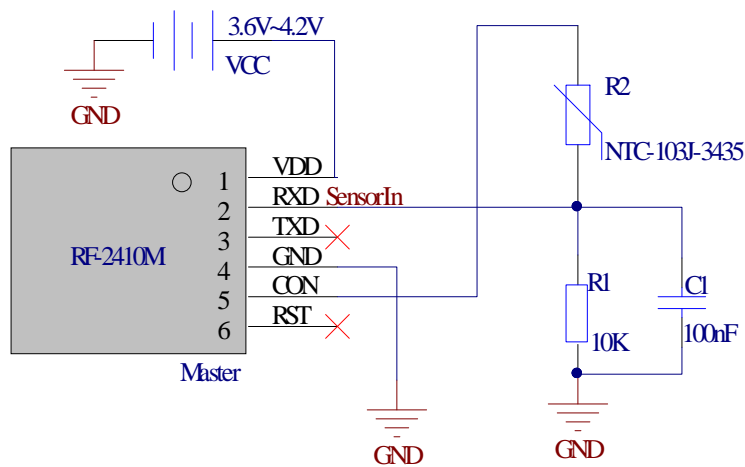
（Figure 01）

2.2. The introduction of temperature acquisition structure

This sample acquisition process temperature collection by NTC sensor. Through PC software RF2410U GatherNet App to set the collection interval and reporting interval of temperature acquisition. And then send RF-2410M module via RF-2410U module.
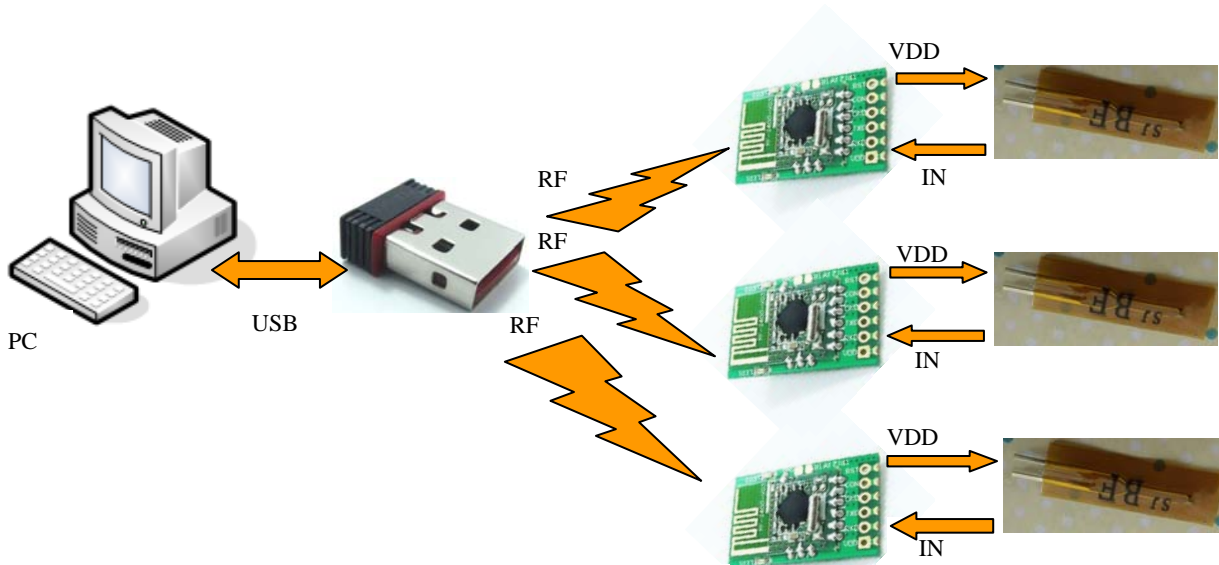
(Figure 02)

When RF-2410M receive PC (RF-2410U) command, it will set sensor's acquisition time and reporting interval according to the received parameters. And transfer the collected data to RF-2410U module by RF wireless transmission. RF-2410U transfers the received data to PC via USB port. PC analyzes and processes the data and show the diversification trend of temperature in the form of data and curves. When RF-2410M is idle, enter into low-power mode. When receive PC command, wake up to enter work mode. When RF-2410M hasn't received PC command in 30 minutes, enter into shutdown mode. In that case, you need to restart.

3. How to download the program?

RF-2410U module program burn adopts RF2410U Loader software provided by INHAOS Company. The software interface is concise and easy to operate. (Please visit www.inhaos.com for more information.)
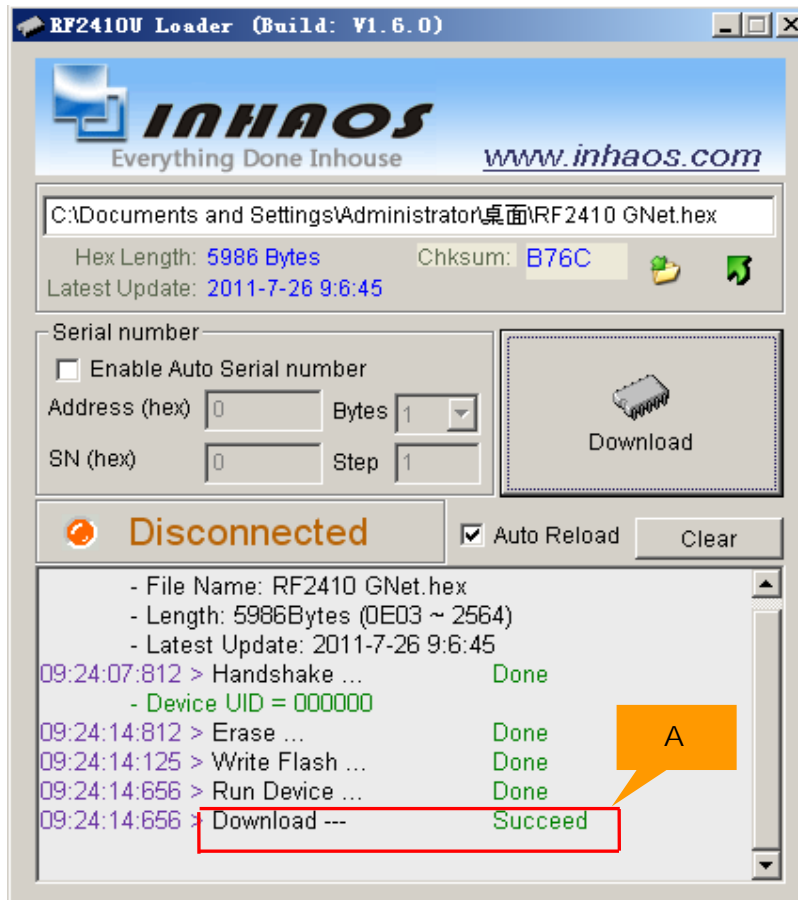
3.1. How to download program to RF-2410U?

1、Double-click to open software will show up the interface like Figure 3.

(Figure 03)

2、Click "Step 1" to load HEX file.

3、Select "Step 2" to enable auto-reload.

4、Click "Step 3" to download.

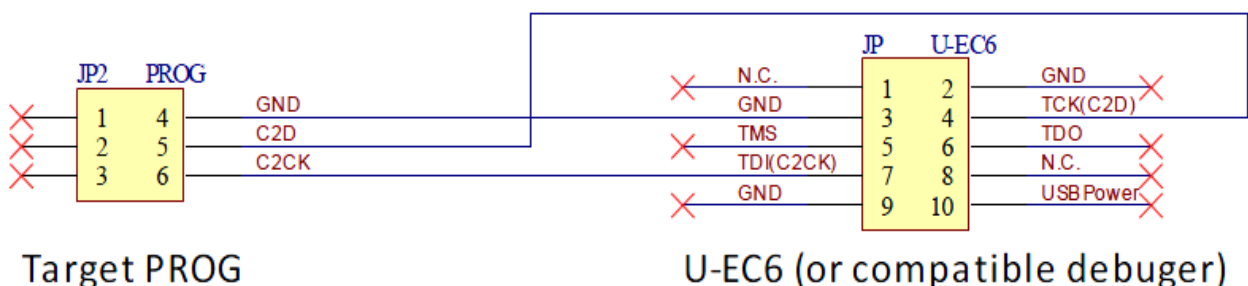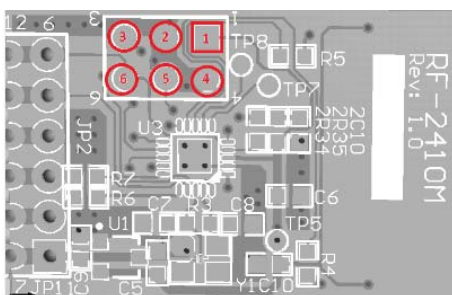5、Insert RF-2410U, wait for completing burning. If shows "A", indicates successfully burned. (As Figure 04 shows).

(Figure 04)

3.2. How to download program to RF2410M?

For RF2410M module, we adopt U-EC6 burner and Silicon-C8051F Programer software to process program burning. You can refer to Figure 05 for wiring.(Please visit www.inhaos.com for more information.)
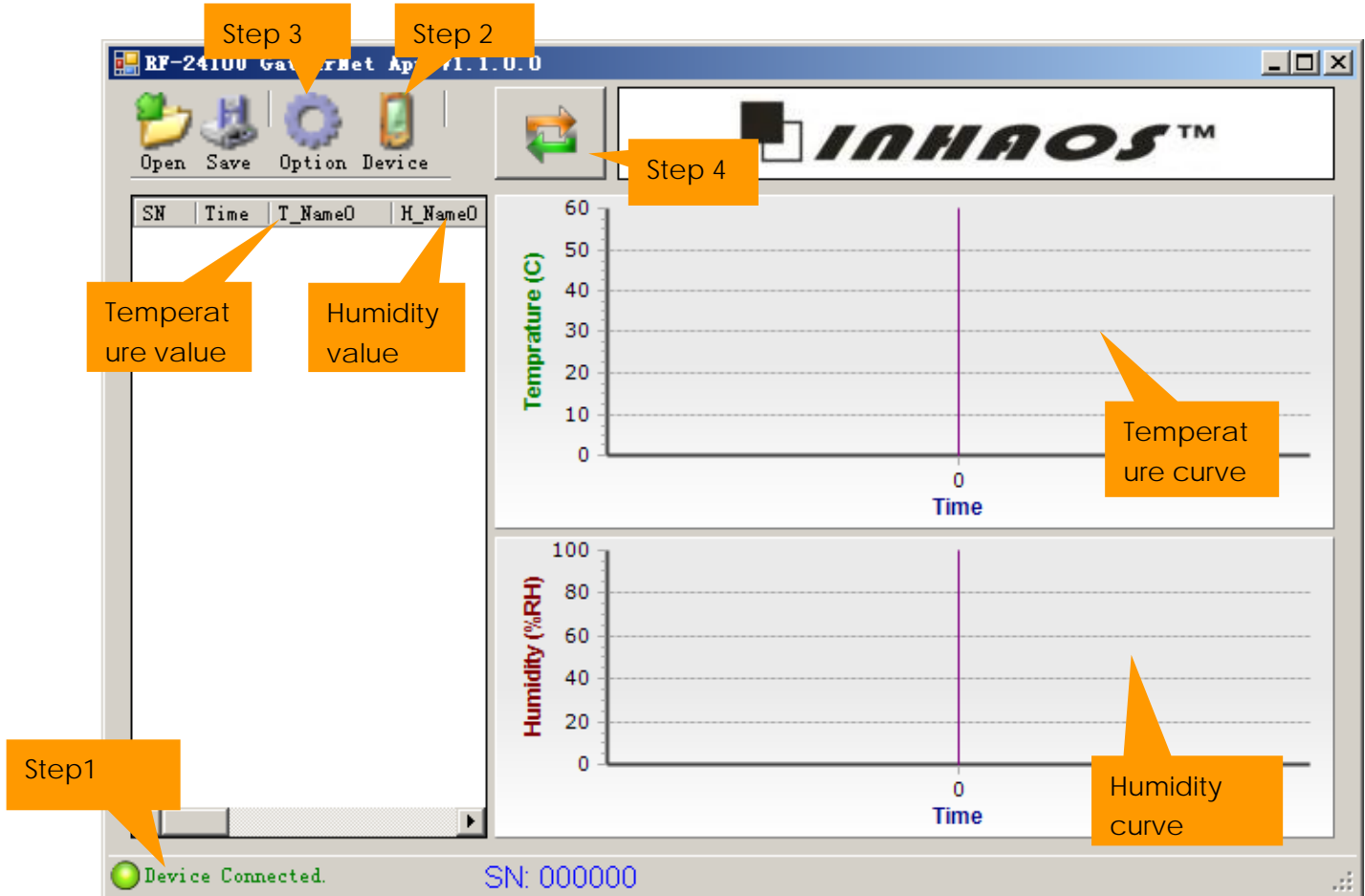

(Figure 05)

4.   RF2410U GatherNet App Software Introduction

RF2410U GatherNet App is mainly used for collecting temperature interval for NTC sensor. RF-2410M reporting interval set, the temperature trend waveform analysis.This software can control several sensors and analyze every sensor's collected data. This software has concise interface and strong practical, easy to operate. RF2410U GatherNet App software use method shows below:

1、Insert RF-2410U, Double-click to open software will shows up the following interface(Figure 06).
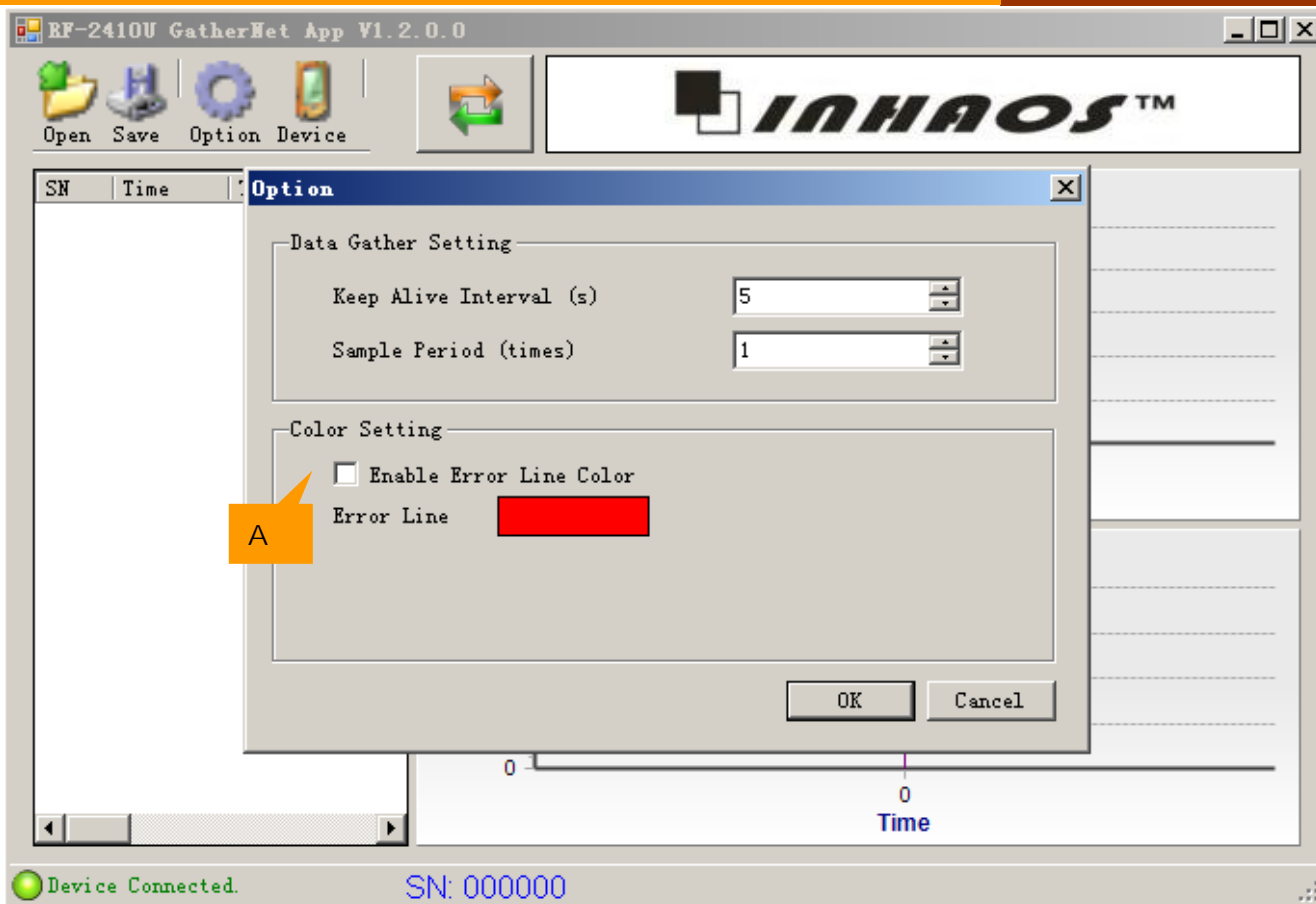

(Figure 06)

2、Check "Step 1" whether display "Device Connected"or not. Otherwise, RF-2410U device haven't been connected, need to re-plug RF-2410U device.

3、Right click "Step 2" to add sensor sub-equipment which need to control. As Figure 07 shows, click "Add" button will appear Add Device dialog. Set the device name in "Name"; "Device UID" set the address which control sub-equipment (RF-2410M port address),set "2a2a2b"; "RF Channel" set RF transmission channel,set "80"; you can select sensor type like temperature sensor, humidity sensor or Tem & Hum sensor in "Type" option. Set Tem & Hum curve's color in "Color" option.
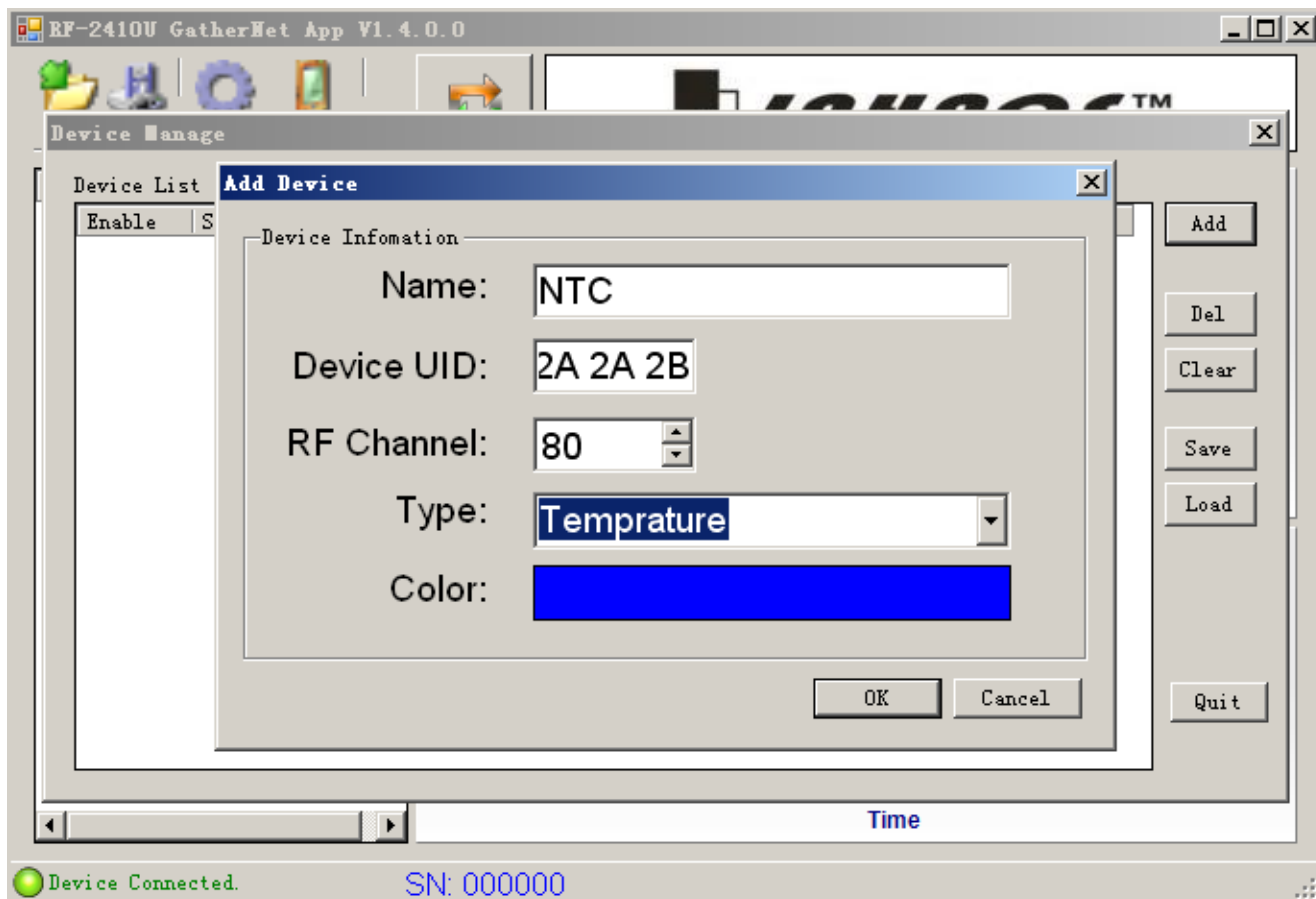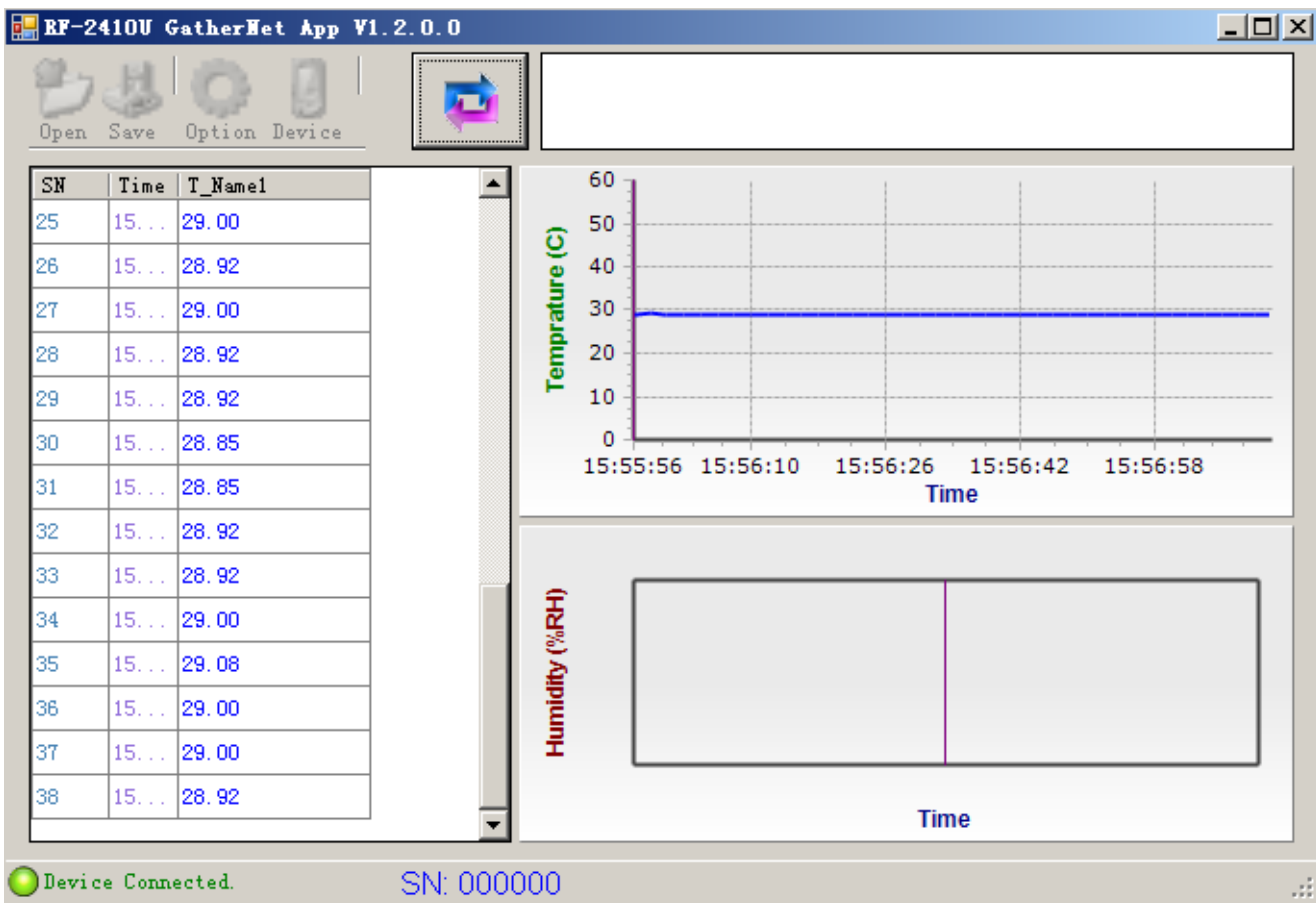
(Figure 07)

4、Right click "Step 3" to set sensor's collection interval and reporting interval. As Figure 08 shows. For example, "Keep Alive Interval" set five, means every 5s pc will check once. Sensor will transfer the collected data to PC by RF wireless transmission. "Sample period" set 1, means sensor collect once for every 5s. Set 2, sensors collect once for every 10s. By setting "A" to mark Temp & Hum curve sensor acquisition error conditions.

(Figure 08)

5、Click "Step 4" to operate. Acquisition results show below(Figure 09).

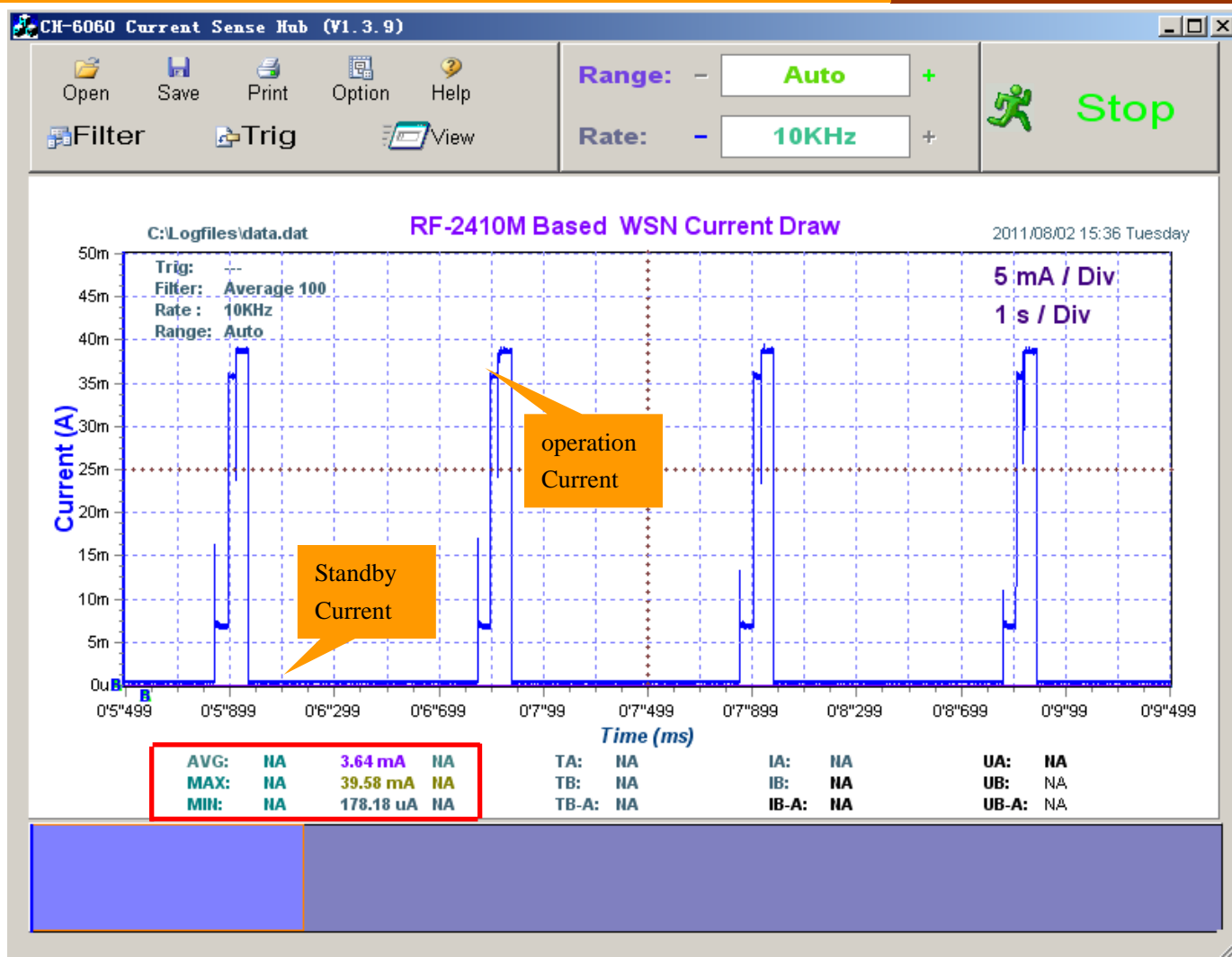(Figure 09)

5.   Power Parameters

We adopt CH-6060 Current Sense Hub produced by INHAOS Company with simple operation, low power, precision, etc. for this sample temperature and humidity acquisition system power test. (PC check once in every 5s and sensor collect once in every 5s in the following demo)

1、When this sample temperature acquisition system is standby mode, the minimum current is about 300uA. The average current consumption is about 250uA. (As Figure 10 shows)
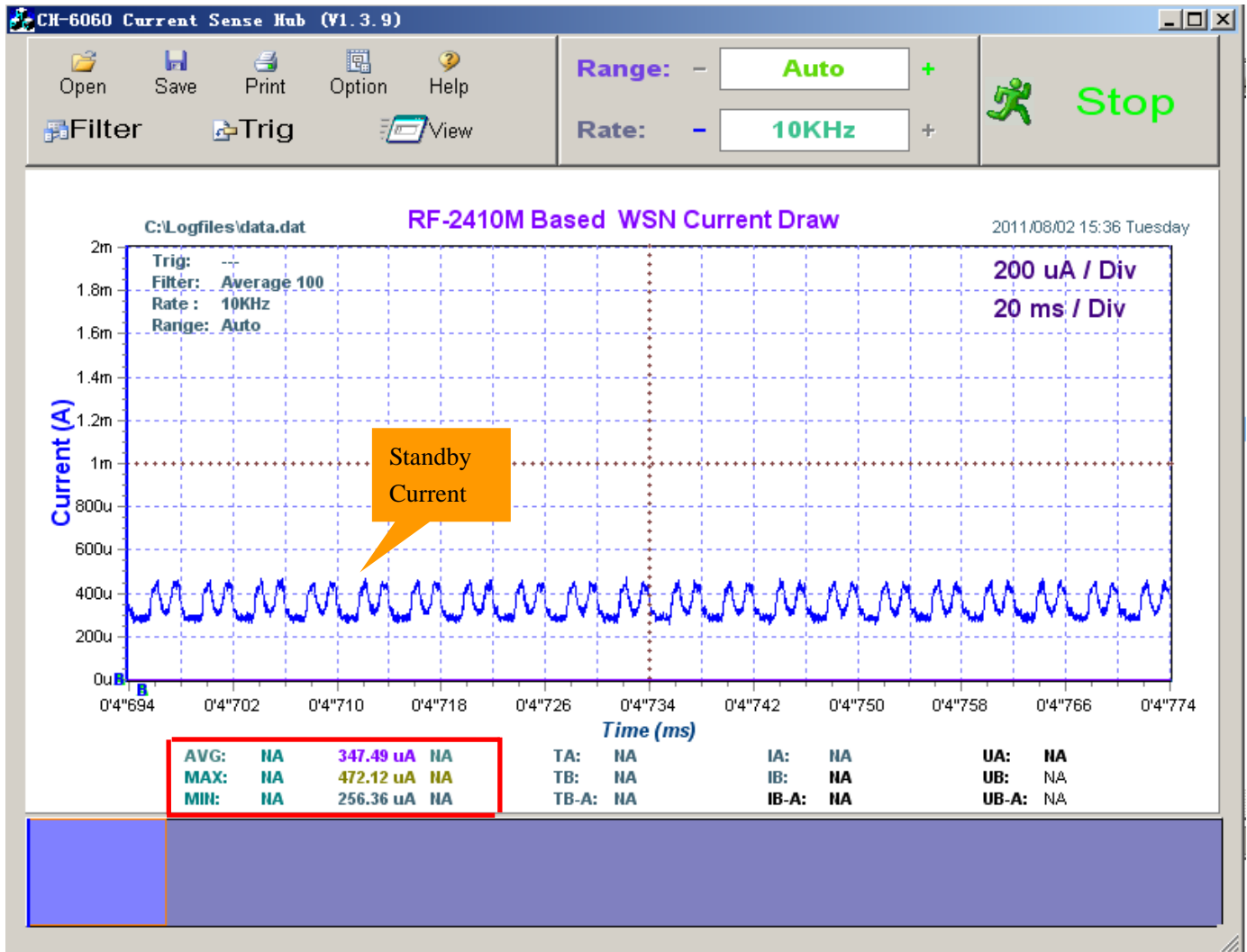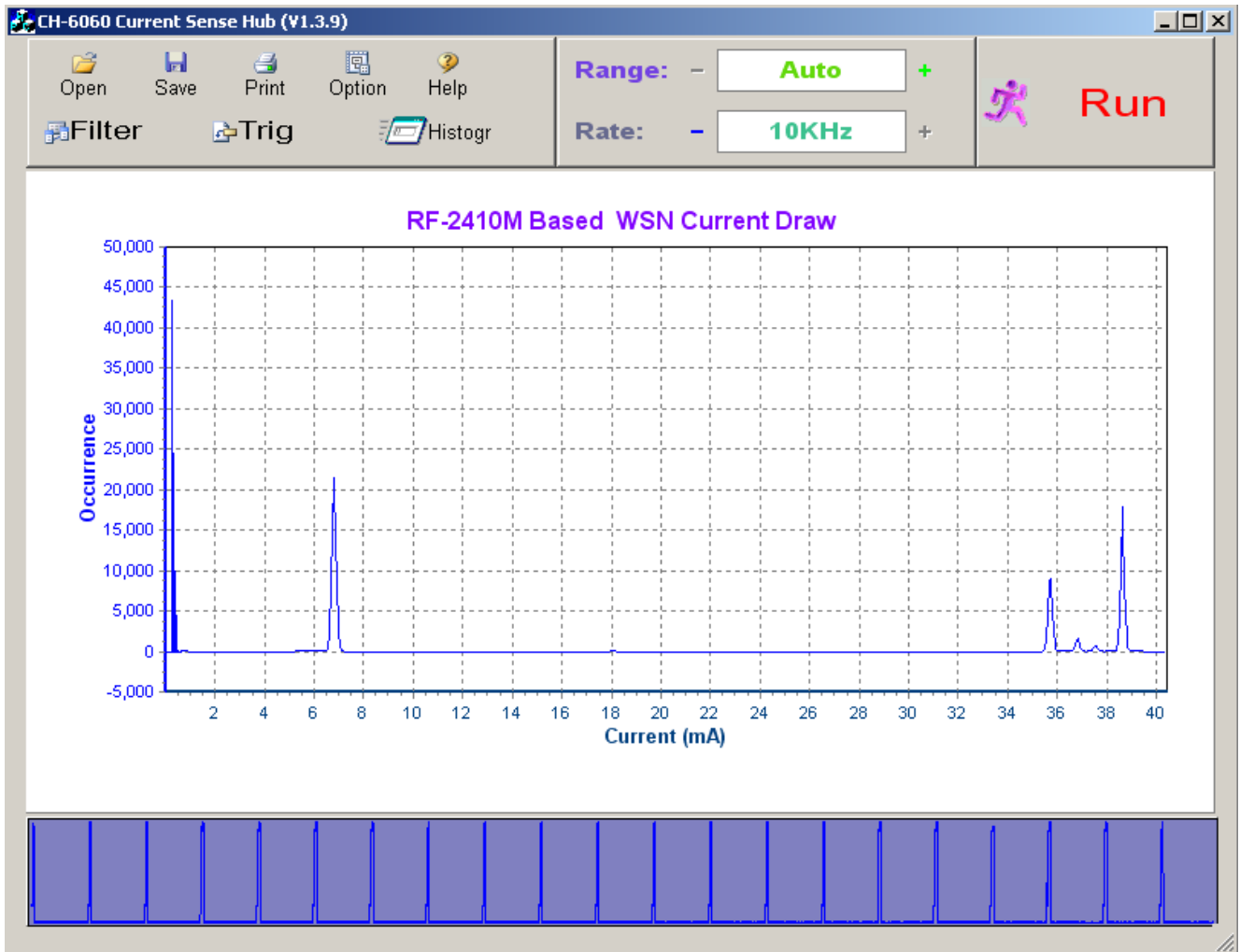

(Figure 10)

2、The current is only about 4mA when working in normal mode. Set the collection interval and the reporting interval longer, the smaller the average current. (As Figure 11 shows)

(Figure 11)

3、Figure 12 shows the current changes for temperature acquisition system in the whole working process. As you can see from the chart, most of the working time is lower than 2mA, and the number of showing time is the most. So this temperature acquisition system is low-power consumption.

(Figure 12)