

Design Information of Full Weather Station

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SOFTWARE INFORMATION

Chapter 1: Function Summarize

The software is designed for the project "Full Weather Station", it include

- a. Wireless transmission of the temperature humidity RCC wind speed, wind direction and pressure of the outdoor and indoor;
- b. Sensor send the information to a wireless receiver inside the home;
- c. Transmission range up to 100ft. in open area;
- d. The system must work normally more than 12 months;
- e. When running at room temperature, the error is no more than $\pm 1^{\circ}\text{C}$ or $\pm 3^{\circ}\text{F}$.
- f. When running at room pressure, the error is no more than $\pm 2\text{mpha}$.
- g. When running at open area wind speed, the error is no more than 0.3ft.
- h, When running at room humidity , the error is no more than 5%.

Chapter 2: Operating Condition

2.1 Operating Temperature

Sender -30 to 70°C (-22 to 158°F)

Receiver 0 to 70°C (32 to 158°F)

2.2 Operating Voltage

Sender 2.4 to 3.6 V

Receiver 4.0 to 4.6 V

2.3 Storage Temperature -40 to 75°C (-40 to 167°F)

Chapter 3: MCU information

Remote Full weather station is composed of MI2529, MI2530 and MI2531.

-MI2529(HT48R10) is outdoor wind speed and wind direction remote transmitter.

-MI2530(HT48R30) is outdoor temperature, humidity and RCC(radio control clock) remote transmitter.

-MI2531(HT46R24) is indoor main unit.

HARDWARE INFORMATION

Full Weather Station is Three product that is designed to show the indoor and outdoor temperature , humidity , RCC(radio control clock) , pressure ,wind speed and wind direction ...,wireless (within 60 feet). It base as fellows:

Outdoor Unit

Using MCU to test the resistor of NTC temperature sensor, and count current temperature, Test the resistor of humidity sensor, and count current humidity. Receiver UE6010 RCC, Then transmitting the encoded data package through the outdoor helix antenna by ASK modulated with 433.92MHz frequency.

Indoor Unit

Receiving the RF signal by PCB antenna, passing LNA, Super-regeneration Amplifier, Demodulator, operating Amplifier, LPF, then decoding the outdoor temperature, RCC humidity, wind speed and wind direction in data package; Otherwise, MCU still test indoor NTC temperature sensor, humidity pressure and calculate the current indoor temperature, humidity, pressure, wind speed, wind direction and display the two temperature value ...in LCD at the same.

The transmitting distance: 60 feet (Open area)

Battery:

MI2529 /MI2530 two AA battery

MI2531 three AA battery

The battery life: not less one year.

Transmitting times:

MI2529 Transmit times interval: 31,37,39 ,41.SEC

MI2530 Transmit times interval: 43,47,51 ,53.SEC

Products standard FCC PART15-22 SECTION19.231

Tx Electrical Characteristics

Vcc Operating supply voltage: 2.4~ 3 3.6 V

Icc Peak Current Connect Tx :6.5 ~9.5 mA

Icc Standby Current No Tx: 0.02 ~0.04 mA

F0 Absolute Frequency :433.72 ~ 434.12 MHz

Po RF Output Power

Vcc = +3V D=3m @-25~-20 dBm

Tc Operating: -30 ~ 70 °C

Notes: Case temperature = 25°C ±2°C

Rx Electrical Characteristics

Vcc Operating supply voltage: 3.5 ~ 4.6 V

Sensitivity=-102dBm

Icc Operating Current In Rx: 2 ~ 4 mA

Icc Standby Current No Rx :0.02 ~0.04 mA

FC :Operation Radio Frequency

Sensitivity=-102dBm @432.92 ~434.92 MHz

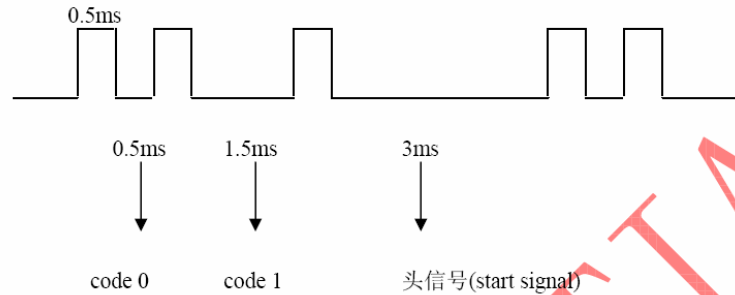
Pref @ Sensitivity 3% Mistake For Code -98 ~-103 dBm

Receiver Turn On Time :400 ms

Notes: Case temperature = $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, Test Load Impedance=50ohm

一、通信协议 (COMMUNICATION PROTOCOL)

1、信号格式(signal format):



发射数据每个字节的高位先发送,低位后发.每个数据包先发一个开始位,然后发送数据位.循环发射.时间不大于一秒.解码连续接收到两个相同的数据包判断数据正确.

Transmitter data is sent from high bit to low bit. There are start bit and data bit in each data packet. The start bit is start point. They are circularly transmitted within one second. It should be received two same data packets during decoding. The two same data packets are judged as the correct data.

2、通信协议(communication protocol):

数据包定义: 每个数据包有 25BIT 数据, 如下图所示,

Data package define: each data package cont 25bits data:

LSB												MSB												
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

