1. MCU

The main purposes microprocessor unit (MCU) are encoding and manipulating temperature and humidity data, clock and drive LCD display.

At power on reset, the MCU is switched into normal time display mode. The MCU takes data from humidity sensor and temperature sensor every 5 minutes. The humidity data and temperature data will show on transmitter LCD display. The MCU will convert this data into digital encoded signals. At this moment, the MCU turn on the RF transmitter. The encoded signals will be modulated and transmitted by the RF transmitter. During the transmitter send signals to the receiver, the antenna icon will flash until the transmitter is switched off.

In order to minimize time drift between transmitter and weather station. The transmitter clock should synchronize with the weather station clock. This can be achieved by sending a 6 ms start code at 12:00am. As the weather station receive this signals, it will reset it's timer to 12:00am. At this moment, the weather station synchronizes with the transmitter.

The A/D in MCU is also responsible to detect the battery voltage level of the battery. When the voltage level is dropped to 2.6V, the MCU will send a low battery signal to the receiver.

2. LCD display

The LCD displays current time, indoor and outdoor temperature and humidity information.

3. RF transmitter

The RF transmitter is composed of a 433.92 MHz resonator and a transmitter. This oscillating circuit modulate the encoded data from MCU into RF modulated signals. When MCU output bit 0, the oscillator will stop oscillate. There is no RF power signal propagating. When MCU output bit 1, the oscillator will oscillate at 433.92 MHz. RF power signals propagate along free space through the loop antenna at this moment. Signals transmission is achieve by RF power signals on/off switching.

4. Humidity sensor

The humidity sensor provides humidity data for MCU. The humidity sensor actually is a variable resistor. The resistance of the sensor change along with the change of humidity. In order to detect the resistance, the capacitor is connected to the sensor. The RC oscillator is formed. When humidity change, the resistance of sensor change. Finally, the frequency of RC oscillator change as resistance change. An A/D converter in MCU is responsible to detect the frequency of the oscillation. The humidity of the sensor could be detected by counting the frequency of oscillation.

5. Temperature sensor

The temperature sensor provides temperature data for MCU. The temperature sensor actually is a variable resistor. The resistance of the sensor change along with the change of temperature. In order to detect the resistance, the capacitor is connected to the sensor. The RC oscillator is formed. When temperature change, the resistance of sensor change. Finally, the frequency of RC oscillator change as resistance change. An A/D converter in MCU is responsible to detect the frequency of the oscillation. The temperature of the sensor could be detected by counting the frequency of oscillation.

6. The function of Q3 is to drive the buzzer in transmitter (amplify the signal current)

7. The function of Q4 is act as an oscillator which modulate the MCU digital coded

signal into RF modulated signal.