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Gree air conditioner infrared code analysis

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> To use infrared remote control air conditioner, you must first understand the principle of infrared remote control and the definition of data. This blog analyzes the infrared codes of the most basic functions of air conditioners, including: switch, temperature, timing, wind speed, sweeping, and check code. Other functions vary greatly due to different air conditioner models, so we will not analyze them for the time being. At the same time, the air conditioner works in cooling mode most of the time, and the codes in other modes are temporarily unresolved.

1. The principle of infrared remote control

2. Experimental waveform

This experiment is based on the infrared data of Gree air conditioner

The composition of a frame of infrared coded data is as follows:

TOP

Start code + 35-bit data + connection code + 32-bit data + end code

Among them, several measurements have obtained:

Start code: 9000us low level + 4500us high level;

Connection code: 646us low level + 20000us high level;

End code: 646us low level + high level;

Data 0: 646us low level + 516us high level;

Data 1: 646us low level + 1643us high level;

The 0 and 1 in the data code have been measured many times and the mode is taken as the basis. The experimental data are as follows:

ir信号	0低电平	1低电平	0高电平	1高电平	
		715	543	1575	
	675	680	516	1610	
	682	646	510	1643	
	674	689	516	1601	
	652	683	538	1607	
	646	648	544	1641	
	653	645	537	1643	
	646	645	544	1642	
	681	646	510	1644	
	677	668	512	1623	
平均值	665.1111	666.5	527	1622.9	
众数	646	646	516	1643	

Three, infrared code analysis

Knowing the 0 and 1 representations of a frame of infrared data, we can freely compose a frame of data. The next thing you need to understand is the meaning of each bit in a frame of data.

Here with **25℃, cooling mode, low wind speed, no sweep, open, timing time is 0** An example of a frame of data:

The first piece of data:

Switch: bit3;

> 0: close; 1: open

Wind speed: bit4, bit5;

> Automatic wind speed: 00
>
> First level wind speed: 10
>
> Secondary wind speed: 01
>
> Three wind speed: 11

Sweeping switch: bit6, and the second segment bit0;

> 0: close; 1: open

Temperature: bit8, bit9, bit10, bit11;

> 16℃: 0000
>
> 17℃: 1000
>
> 18℃: 0100
>
> 19℃: 1100
>
> 20℃: 0010
>
> 21℃: 1010
>
> 22℃: 0110
>
> 23℃: 1110
>
> 24℃: 0001
>
> 25℃: 1001
>
> 26℃: 0101

> 27℃: 1101
>
> 28℃: 0011

Timing minutes: bit12, bit13, bit14;

Since my mobile phone can only send the timing time whose minimum unit is half an hour, so there is only 30 minutes of timing data

> 30min: 100

bit15 timer switch;

> 0: close; 1: open

Timing hours: bit16, bit17, bit18, bit19;

> One hour: 1000
>
> Two hours: 0100
>
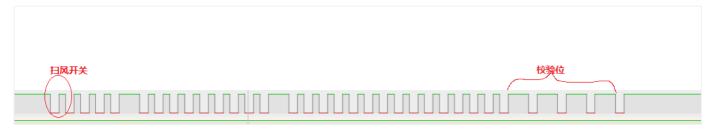> Three hours: 1100
>
> ...

The second piece of data:

The second piece of data is relatively simple, and what needs attention is **bit0**Is the switch for sweeping wind, she and the first piece of data**bit6**It is the same value.

The other four**bit28,bit29,bit30,bit31**Composition check code.

There are also many formulas for check codes on the Internet, but after trying them, I found that they are not applicable, so I tried a formula myself:

Check code = temperature-18 + timing hours + air conditioning switch × 8;

For example, the check code in the above example is: 25-18 + 0 + 1× 8 = 15 = 0xf;

Four, summary

The realization of infrared remote control is similar, it is better to have test equipment to test the code. Infrared receiver tube and logic analyzer are your best choices.

Friendly connection:

esp32 realizes infrared emission and reception

The author's talent is weak and learning, it is inevitable to make mistakes, I hope to correct me. If the article is helpful to you, please give me a compliment.

Intelligent Recommendation