

Amlogic Application Notes



Application Notes

IR Remote Control Key Value Configuration Guide

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Revision 0.1

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Modify records

| Version | date | author | Revise |
|---------|---------------|-----------------------|-------------------------------|
| 0.1 | March 5, 2013 | baoqi.wang Jun | change mode & add message |
| 0.2 | 18,2014 | baoqi.wang Jun Cao Xu | Support 20 remote |
| 0.3 | | | Add remote.conf config sample |

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1. Overview

1.1. REMOTE Program framework

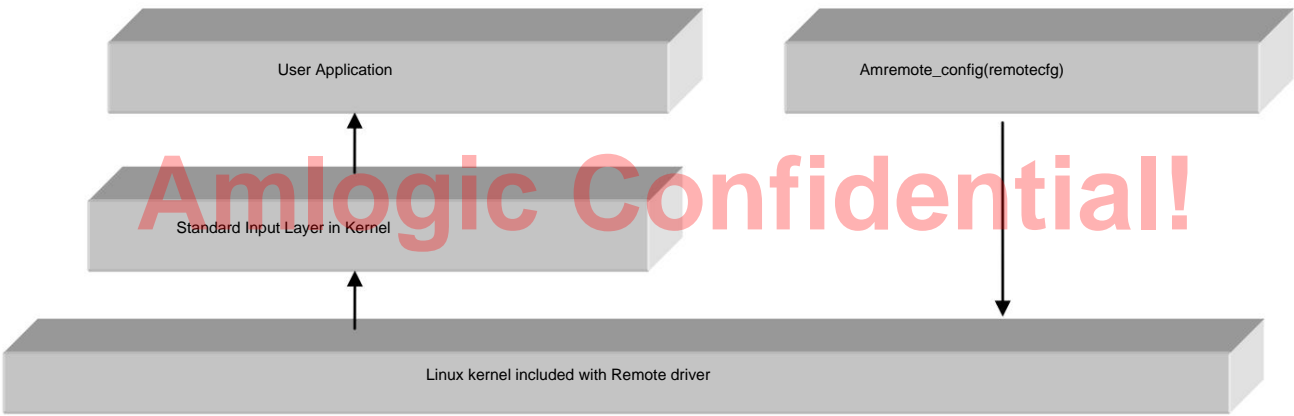
The Amlogic chip integrates a decoder that conforms to the NEC timing sequence. The software mode can also be used for the infrared protocol that does not conform to the NEC protocol. The customized infrared protocol can be customized very flexibly. Special protocols larger or smaller than 32bit have not been tested. The driver part The code needs to be modified to accommodate non-32bit protocols. Drivers provided in the Linux kernel can be configured by applications to work in one of these modes.

There is a remotecfg command in the software package we released, which is used to configure the kernel driver. Users can write their own configuration files according to the rules to adapt their remote controllers, and then use the serial port remotecfg system/etc/*.conf to Configure the corresponding registers of the IR decoder. This can be configured multiple times without restarting the system, which is very convenient for debugging.

Our driver can completely convert the button events of the infrared remote control to the standard input event of Linux, so the user program can convert the infrared remote control Handles standard keyboard and mouse events.

For simulating mouse movement with the remote control, an acceleration process is provided in the driver. Press and hold, and the mouse movement will accelerate. Currently, the maximum movement is 10 pixels, but there is no application layer interface, so if you need to modify this acceleration effect, you must modify it. driver code.

Application Architecture Block Diagram:



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2. Software operation

2.1. General configuration items:

- work_mode work mode setting, 1 is duokan, 0 is NEC.
- factory_code Remote control user code, according to MSB format, written in high 16 bits, low 16 bits can be filled with any value. Configuration of factory_code Introduced in Appendix IV.
- Whether repeat_enable supports pressing the continuous key, the default is not supported.
- debug_enable Enables driver debug printing, the default is not supported. Can be set to 1 to test a remote with unknown user code and key code.
- release_delay Time interval for releasing the key, in ms, the default is 200ms.
- repeat_delay is the time interval from pressing the key to the first burst key, in ms, the default is 250ms.
- repeat_peroid The time interval between two burst keys, the unit is ms, the default is 33ms.
- factory_incode = n (n<=20) to add the nth group of factory code mapping table, which is usually not used when supporting n nec remote controllers

2.2. Basic register configuration items:

For the detailed configuration of these registers, please refer to M8Baby-AO-Registers.doc

2.3. keymap

- The keymap table needs to start with the "key_begin" string line and end with the "key_end" string line.
- Each line corresponds to a key mapping relationship, the front is the key value of the infrared key, and the back is the corresponding standard key scan code, with a space as the separator.
- Multiple key values can correspond to a key scan code, but for repeated key value positioning, only the last corresponding relationship shall prevail.
- For the writing format, please refer to the examples in Chapter 3 and Appendix 4.

2.4. mouse direction map

- The mouse direction mapping table needs to start with the "mouse_begin" string line and end with the "mouse_end" string line.
- Each line corresponds to a direction mapping relationship, the front is the direction number identifier, the back is the key value of the infrared button, and the space is used as the separator.

Direction Numeric Identifier Comparison Table

| | |
|---|-------|
| 0 | Left |
| 1 | Right |
| 2 | Up |
| 3 | Down |

Multiple key values cannot correspond to one direction, only the last corresponding relationship shall prevail.

Special custom add method:

- fn_key_scancode = 0xfe (scancode) Specifies the mouse to open the function key
 - left_key_scancode = 0x1c specifies the left mouse button
 - right_key_scancode = 0x48 specifies the right mouse button
 - up_key_scancode = 0x44 specifies the mouse up button
 - down_key_scancode = 0x1d specifies the mouse down key
 - ok_key_scancode = 0x5c specifies the mouse confirmation key
 - pageup_key_scancode = 0x04 specifies the previous page key
 - pagedown_key_scancode = 0x1b specifies the next page key
- The writing format can refer to the example in Chapter 3.

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3. Sample

3.1. Appendix I **NEC** configuration file

1) The following configuration is the Amlogic m200 public version of the media box remote control

```
#amlogic NEC remote factory_code
= 0xfb040001 work_mode = 0 repeat_enable = 1
repeat_delay = 40 repeat_peroid = 39
release_delay = debug_enable = 1
```

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key_begin

```
0x01 0x02 #The number key 1 on the remote control is mapped to the number key 1 of the standard keyboard
0x02 0x03 #The number key 2 on the remote control is mapped to the number key 2 of the standard keyboard
0x03 0x04 #The number key 3 on the remote control is mapped to the number key 3 of the standard keyboard
0x04 0x05 #The number key 4 on the remote control is mapped to the number key 4 of the standard keyboard
0x05 0x06 #The number key 5 on the remote control is mapped to the number key 5 of the standard keyboard
0x06 0x07 #The number key 6 on the remote control is mapped to the number key 6 of the standard keyboard
0x07 0x08 #The number key 7 on the remote control is mapped to the number key 7 of the standard keyboard
0x08 0x09 #The number key 8 on the remote control is mapped to the number key 8 of the standard keyboard
0x09 0x0a #The number key 9 on the remote control is mapped to the number key 9 of the standard keyboard
0x00 0x0b #The number key 0 on the remote control is mapped to the number key 0 of the standard keyboard
0x0d 0x10 #The OK button on the remote control is mapped to the left button of the standard mouse
0x41 0x11 #The key on the remote control is mapped to the right key of the standard mouse
```

key_end

mouse_begin

```
0 0x10 #Arrow key left
1 0x11 #Arrow key right
2 0x0b # on the arrow keys
3 0x0e #down arrow key
```

mouse_end

2) If adding a nec remote control configuration file remotesecond.conf as follows:

```
#amlogic NEC remote
factory_infcode = 1
Other content is the same as the previous configuration file
factory_code = 0xfe010001
key_begin
0x03 4
0x55 221
key_end
```

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3.2. Appendix II Scanning Code Table of Commonly Used Keys

| Scan code | button | Scan code | Button | Scan code | button |
|-----------|---------------|-----------|--------------|-----------|--------------|
| 1 4 7 | Escape 3 | 2 5 8 | 1 4 | 3 6 9 | 2 |
| 10 | 6 9 | 11 | 7 0 | 12 | 5 |
| | | | | | 8 |
| | | | | | Minus |
| 13 | Equal | 14 | Backspace | 15 | Tab |
| 16 | Q | 17 | In | 18 | AND |
| 19 | R | 20 | T | 21 | Y |
| 22 | IN | 23 | | 24 | O |
| 25 | P | 26 | | 27 | J |
| 28 | Enter | 29 | Left_Ctrl | 30 | A |
| 31 | S | 32 | D | 33 | F |
| 34 | G | 35 | H | 36 | J |
| 37 | K | 38 | L | 39 | . |
| 40 | | 41 | | 42 | Left_Shift |
| 43 | \ | 44 | | 45 | X |
| 46 | C | 47 | IN | 48 | B |
| 49 | N | 50 | | 51 | . |
| 52 | . | 53 | M / | 54 | Right_Shift |
| 55 | Print_Screen | 56 | Left_Alt | 57 | Space |
| 58 | Caps_Lock | 59 | F1 | 60 | F2 |
| 61 | F3 | 62 | F4 | 63 | F5 |
| 64 | F6 | 65 | F7 | 66 | F8 |
| 67 | F9 | 68 | F10 | 69 | Num_Lock |
| 70 | Scroll_Lock | 71 | NumPad_7 | 72 | NumPad_8 |
| 73 | NumPad_9 | 74 | NumPad_Minus | 75 | NumPad_4 |
| 76 | NumPad_5 | 77 | NumPad_6 | 78 | NumPad_Plus |
| 79 | NumPad_1 | 80 | NumPad_2 | 81 | NumPad_3 |
| 82 | NumPad_0 | 83 | NumPad_Del | 84 | |
| 85 | | 86 | | 87 | F11 |
| 88 | F12 | 89 | | 90 | |
| 91 | | 92 | | 93 | |
| 94 | | 95 | | 96 | |
| 97 | | 98 | | 99 | |
| 100 | | 101 | | 102 | Home |
| 103 | Up | 104 | Page_Up | 105 | Left |
| 106 | Right | 107 | End | 108 | Down |
| 109 | Page_Down | 110 | Insert | 111 | Delete |
| 112 | | 113 | Mute | 114 | VolumeDown |
| 115 | VolumeUp | 116 | Power | 117 | |
| 118 | | 119 | Pause | 128 | Stop |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0x110 | Mouse_Left | 0x111 | Mouse_Right | 0x112 | Mouse_Middle |
| 0x115 | Mouse_Forward | 0x116 | Mouse_Back | | |
| | | | | | |
| 0x130 | GamePad_A | 0x131 | GamePad_B | 0x132 | GamePad_C |
| 0x133 | GamePad_X | 0x134 | GamePad_Y | 0x135 | GamePad_Z |
| | | | | | |

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3.3. Appendix III **Android** The following key process description

Android provides a comparison mapping table method from standard input device scan codes to Android API buttons. In Amlogic's development system, Please refer to device\amlogic\xxref\Vendor_0001_Product_0001.kl
So you need to modify this mapping table to fit your remote control buttons

3.4. Appendix IV **AND** remote control **remote.conf** file key configuration

For the conversion between the infrared code of the IR remote control and the key value of the Android Input system, it can basically be configured through remote.conf to meet the requirements. Take the MENU key of the public board NEC protocol as an example.

When the user presses the MENU key, the DECODER finishes decoding. The driver of the Kernel reads the FRAME_BODY register to get the remote control Infrared RAW value am_remote_read_reg(FRAME_BODY). The RAW value of the MENU key is 0xac53fb04, this value contains custom code and ~custom code, and data code and ~data code. According to the driver's parsing of NEC protocol DOMAIN, fb04 is a custom value (this value For configuration factory_code= 0xfb040001 in remote.conf factory_code). ac53 is the data value, where ac and 53 are one's complement, is used for data comparison. But the driver does not add this function by default, and only takes the value 53. The infrared code of the MENU key is 0x53

The Keycode of the MENU key in the Android Input system needs to refer to the corresponding KeyLayout file. According to VendorID and ProductID, The public version of the infrared remote control corresponds to device\amlogic\xxref\Vendor_0001_Product_0001.kl.

Query this file, you can know that the Keycode of the MENU key is 125
key 125 MENU

Then the remote.conf file is to associate these two values. The configuration of the menu key in remote.conf is as follows:

key_begin

...

0x53 125#

...

The key_end

driver parses remote.conf, finds the corresponding keycode through the infrared code, and then uses the Input system standard function input_event() report. Complete the conversion from infrared code to standard key value.

This remote.conf is configured by init.amlogic.rc when the system starts, so if you need to create another conf file,

Need to change to the corresponding name

```
service remotecfg /system/bin/remotecfg /system/etc/remote.conf
class main
    Oneshot
```

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