

SigmaStar Camera I2C 使用参考



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{SigmaStar Part Name}



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TABLE OF CONTENTS

REVISION HISTORY					
	BLE OF CONTENTS				
	概述				
	1.1. 概述				
	使用 I2C				
	2.1. 读写 I2C				





1. 概述

1.1. 概述

Table 1: 表 1-1

I2C Group	SCL	SDA	DEV
HW I2C group0	PAD_I2C0_SCL	PAD_I2C0_SDA	/dev/i2c-0
HW I2C group1	PAD_I2C1_SCL	PAD_I2C1_SDA	/dev/i2c-1,

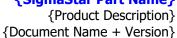
提供两组组 HW I2C,第一组 HW I2C 对应 pad 是 PAD_I2C0_SCL/ PAD_I2C0_SDA,对应节点是/dev/i2c-0;第二组 HW I2C 对应 pad 是 PAD_I2C1_SCL/ PAD_I2C1_SDA,对应节点是/dev/i2c-1。

这是所有 i2c 全开的情况,如果实际情况中没有打开这么多 i2c,要根据 mhal_iic.h 中"#define HAL_HWI2C_PORTS 2"的定义和 infinity6b0.dtsi 中 i2c device node 的定义情况,而对应的节点一般看 i2c-group = <0>;定义的值是多少。

```
i2c0@0{
   compatible = "mstar,i2c";
   status = "ok";
   reg = <0x1F226800 0x200>,<0x1F204c00 0x200>,<0x1F206600 0x200>;
   //clocks = <&CLK_miic0>;
   i2c-group = <0>;
   i2c-dma = <0>;
   /*
   * padmux: 1 -> PAD_I2C0_SCL, PAD_I2C0_SDA
   */
   i2c-padmux = <1>;
};
```

Figure 2: 图 1-1

下面所有的描述都是以第一组 HW I2C 为例, 其他 I2C 请参照第一组的使用方法。





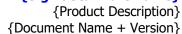
2. 使用 I2C

2.1. 读写 I2C

通过标准的 ms_i2c_xfer 函数来读写 I2C,以下是一个使用的小例子。

```
#include <stdio.h>
#include ux/types.h>
#include <stdlib.h>
#include <fcntl.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/ioctl.h>
#include <errno.h>
#include <assert.h>
#include <string.h>
#include ux/i2c.h>
#include linux/i2c-dev.h>
#define FILE NAME "/dev/i2c-0"
static int i2c_write(int fd,unsigned char slave_addr, unsigned char reg_addr, unsigned char value)
{
    unsigned char outbuf[2];
    struct i2c_rdwr_ioctl_data packets;
    struct i2c_msg messages[1];
    messages[0].addr = slave addr;
    messages[0].flags = 0;
    messages[0].len
                       = sizeof(outbuf);
    messages[0].buf = outbuf;
    /* The first byte indicates which register we 'll write */
    outbuf[0] = reg addr;
    /*
     * The second byte indicates the value to write. Note that for many
     * devices, we can write multiple, sequential registers at once by
     * simply making outbuf bigger.
     */
```







```
outbuf[1] = value;
    /* Transfer the i2c packets to the kernel and verify it worked */
    packets.msgs = messages;
    packets.nmsqs = 1;
    if(ioctl(fd, I2C_RDWR, &packets) < 0)
         perror("Unable to send data");
        return 1;
    }
    return 0;
}
static int i2c_read(int fd, unsigned char slave_addr, unsigned char reg_addr, unsigned char *value)
    unsigned char inbuf, outbuf;
    struct i2c_rdwr_ioctl_data packets;
    struct i2c_msg messages[2];
     * In order to read a register, we first do a "dummy write" by writing
     * 0 bytes to the register we want to read from. This is similar to
     * the packet in set_i2c_register, except it 's 1 byte rather than 2.
     */
    outbuf = reg addr;
    messages[0].addr = slave addr;
    messages[0].flags = 0;
                       = sizeof(outbuf);
    messages[0].len
    messages[0].buf
                       = &outbuf;
    /* The data will get returned in this structure */
    messages[1].addr = slave addr;
    messages[1].flags = I2C_M_RD/* | I2C_M_NOSTART*/;
    messages[1].len
                       = sizeof(inbuf);
    messages[1].buf
                       = &inbuf;
    /* Send the request to the kernel and get the result back */
    packets.msgs
                        = messages;
    packets.nmsqs
                        = 2;
    if(ioctl(fd, I2C_RDWR, &packets) < 0)
    {
         perror("Unable to send data");
         return 1;
```

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```
*value = inbuf;
    return 0;
}
int main(int argc, char **argv)
{
    int fd;
    unsigned int slave_addr=0, reg_addr=0, value = 0;
    if (argc < 4){
         printf("Usage:\n%s r[w] start_addr reg_addr [value]\n",argv[0]);
         return 0;
    }
    fd = open(FILE_NAME, O_RDWR);
    if (!fd)
    {
         printf("can not open file %s\n", FILE_NAME);
         return 0;
    }
    sscanf(argv[2], "%x", &slave_addr);
    sscanf(argv[3], "%x", &reg_addr);
    if(!strcmp(argv[1],"r"))
    {
         i2c_read(fd, slave_addr, reg_addr, (unsigned char*)&value);
    }
    else if(argc>4&&!strcmp(argv[1],"w"))
         sscanf(argv[4], "%x", &value);
         i2c_write(fd, slave_addr, reg_addr, value);
    }
    close(fd);
    return 0;
}
```