基於N76E003實現Wiegand協議封包

NuMicro® 8 位系列微控制器範例代碼介紹

文件資訊

代碼簡述	本範例代碼基於N76E003的計時器(Timer)與通用輸入輸出接口(GPIO)實現收發Wiegand 協議封包
BSP 版本	N76E003_BSP_Keil_C51_V1.0.6
開發平台	NT-N76E003 V2.1

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1 功能介紹

1.1 簡介

Wiegand通訊協定由摩托羅拉公司制定，廣泛應用於門禁系統的讀卡器和電子卡片，為現今的工業標準，最常見的格式為標準的26-bit封包。本範例代碼基於N76E003的計時器(Timer)與通用輸入輸出接口(GPIO)實現收發26-bit的Wiegand協議封包。

1.2 Wiegand 協議

Wiegand介面是一種通訊協定，由3根線組成 Data0, Data1, Data return。Data0與Data1在沒有資料輸出時保持+5V高電平。若輸出為0，則D0拉低一段時間；若輸出為1，則D1拉低一段時間。

1.3 Wiegand 協議結構

標準Wiegand協定是由26位二進位數字組成，定義如下：

Bit	含義
Bit 1	作為 BIT[2:13] (A Data) 隱含碼(HID, Hidden ID code)的奇偶校驗位
Bit [2:9]	低8位 (A Data)，作為隱含碼使用，Bit 2 是MSB
Bit [10:25]	高16位 (B Data)，作為公開碼(PID, Public ID code)使用 Bit 10 是MSB
Bit [26]	作為BIT [14:25] (B Data) 公開碼的奇校驗位

組合為26位數據如下

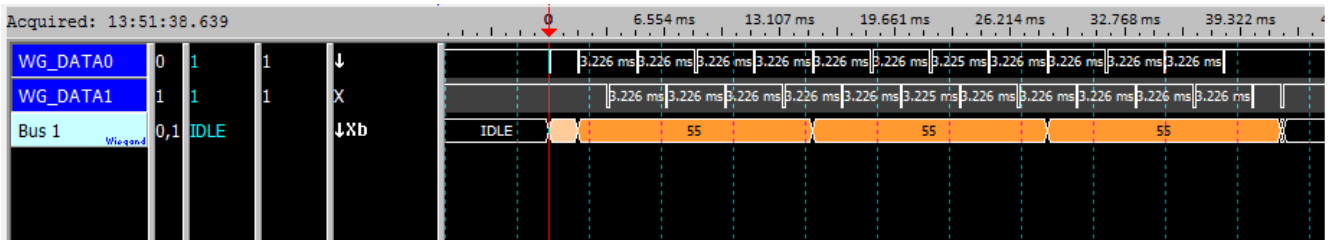
1	2	3	4	5		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
P	A	A	A	A		A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	P
		Even parity Field								Odd Parity Field																
		Facility Code								Card Number																

Public ID code (PID): 不同卡片具有不同的公開碼，以區別用戶。

Hidden ID code (HID): 隱含碼存放在卡片中，也存放於讀卡器中，假如卡片與讀卡器中的HID碼不同的話，卡片將無法在讀卡器上使用。.

1.4 執行結果

送出 0x55, 0x55, 0x55 後量測到的 Weigand Bus 結果



2 代碼介紹

主程式:

```
/*---------------------------------------------------------------------------*/
/* Global variables                                                          */
/*---------------------------------------------------------------------------*/
unsigned char out[3] = {0x55, 0x55, 0x55};

/*---------------------------------------------------------------------------*/
/* Functions                                                                 */
/*---------------------------------------------------------------------------*/
void main(void)
{
    //Keep wiegand bus on high state.
    P05 = 1;
    P06 = 1;
    //initial all gpio on quasi mode
    Set_All_GPIO_Quasi_Mode;
    delay_1500us();
    //send wiegand package
    send_wiegand26(out);
    while(1);
}
```

發送 26 位數據的程式

```
void send_wiegand26(unsigned char *str)
{
    unsigned char data i;
    unsigned  char check_temp;
    unsigned char data check;
    bit  even;
    bit  odd;
    unsigned char data wiegand[3];

    wiegand[0] = *str;
    wiegand[1] = *(str + 1);
    wiegand[2] = *(str + 2);
    check = 0;
    check_temp = wiegand[0];
    //even data check for data 2-9
    for(i = 0; i < 8; i++)
    {
        if((check_temp & 0x80) == 0X80)
        {
            check++;
        }
        check_temp = check_temp << 1;
    }
    if(check % 2 == 0)
        even = 0;
    else
        even = 1;
    check = 0;
    //odd data check for data 10-25
    check_temp = wiegand[1];
    for(i = 0; i < 8; i++)
    {
        if(check_temp & 0x80 == 0X80)
```

```
        {
            check++;
        }
        check_temp = check_temp << 1;
    }
    check_temp = wiegand[2];
    for(i = 0; i < 8; i++)
    {
        if(check_temp & 0x80 == 0X80)
        {
            check++;
        }
        check_temp = check_temp << 1;
    }
    if(check % 2 == 0)
        odd = 1;
    else
        odd = 0;
    //send header ep
    if(even)
    {
        WG_send_bit_1();
    }
    else
    {
        WG_send_bit_0();
    }
    //send data
    for(i = 0; i < 24; i++)
    {

        if((wiegand[0]) & 0x80)
        {
            WG_send_bit_1();
        }
        else
        {
            WG_send_bit_0();
        }
        (*(long*)&wiegand[0]) <<= 1;
    }
    //send op
    if(odd)
    {
        WG_send_bit_1();
    }
    else
    {
        WG_send_bit_0();
    }
}           …
        GPIO_CLR_INT_FLAG(PE, BIT0);
    }
```

3 軟體與硬體環境

- **軟體環境**
  - BSP 版本
    - N76E003_BSP_Keil_C51_V1.0.6
  - IDE 版本
    - Keil uVersion 4.6 及 PK51 Development Kit V9.52
- **硬體環境**
  - 硬體需求
    - NT-N76E003 V2.1 兩組
  - 接線圖

VCC	↔	VCC
P05	↔	P05
P06	↔	P06
GND	↔	GND
NT-N76E003 V2.1 (主設備)		NT-N76E003 V2.1 (從設備)

4 目錄資訊

- N76E003 Wiegand_V1.0
  - Common: N76E003 common function library.
  - Include: N76E003 code header.
  - Sample_Code
    - ExampleCode： Source file of example code
      - Wiegand_Master: Example code source file of wiegand master.
      - Wiegand_Slave: Example code source file of wiegand slave.
  - Startup
    - N76E003: startup code.

5 如何執行範例程式

1. 本專案支援Keil uVersion 4.6及以上版本
2. 根據目錄資訊進入Sample_Code\ExampleCode資料夾，雙擊Wiegand_Master與Wiegand_Slave資料夾中的Wiegand_Master.uvproj與Wiegand_Slave.uvproj
3. 進入編譯模式介面
   a. 編譯
   b. 下載代碼至記憶體
   c. 進入 / 離開除錯模式
4. 進入除錯模式介面
   a. 可別進入除錯模式進行調試
   b. 執行代碼

6 修訂紀錄

日期	版本	描述
Sep. 24, 2019	1.00	1. 初始發布.

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