M258 产生PDF 档案

NuMicro® 32 位系列微控制器范例代码介绍

文件信息

应用简述	本范例代码演示如何在 USB DISK 上的 FAT 文件系统建立 PDF 档案。
BSP 版本	M251/M252/M254/M256/M258 BSP CMSIS V3.01.002
开发平台	NuMaker-M258KE Ver1.1

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1 概述

微控制器 M258 透过 USB 通讯端口连接计算机，实作大容量储存装置类别，可在USB DISK 上存取FAT 文件系统。并且提供范例程序代码，示范如何写入PDF 档案到USB DISK 上的FAT 文件系统，使用者即可将微控制器作为一般的外接 USB 随身碟使用，可在个人计算机上进行档案的写入与读取。请注意，此范例程序也适用于M252 系列。

1.1 执行结果

将 M258 USB 接入计算机，开启【设备管理器】，可看到 Disk drives 区域出现 Nuvoton DataLogger USB Device 装置，如图 1-1 所示。此时至【我的计算机】开启外接装置的储存槽，可看到创建的PDF 档案，执行结果如图 1-2 所示。

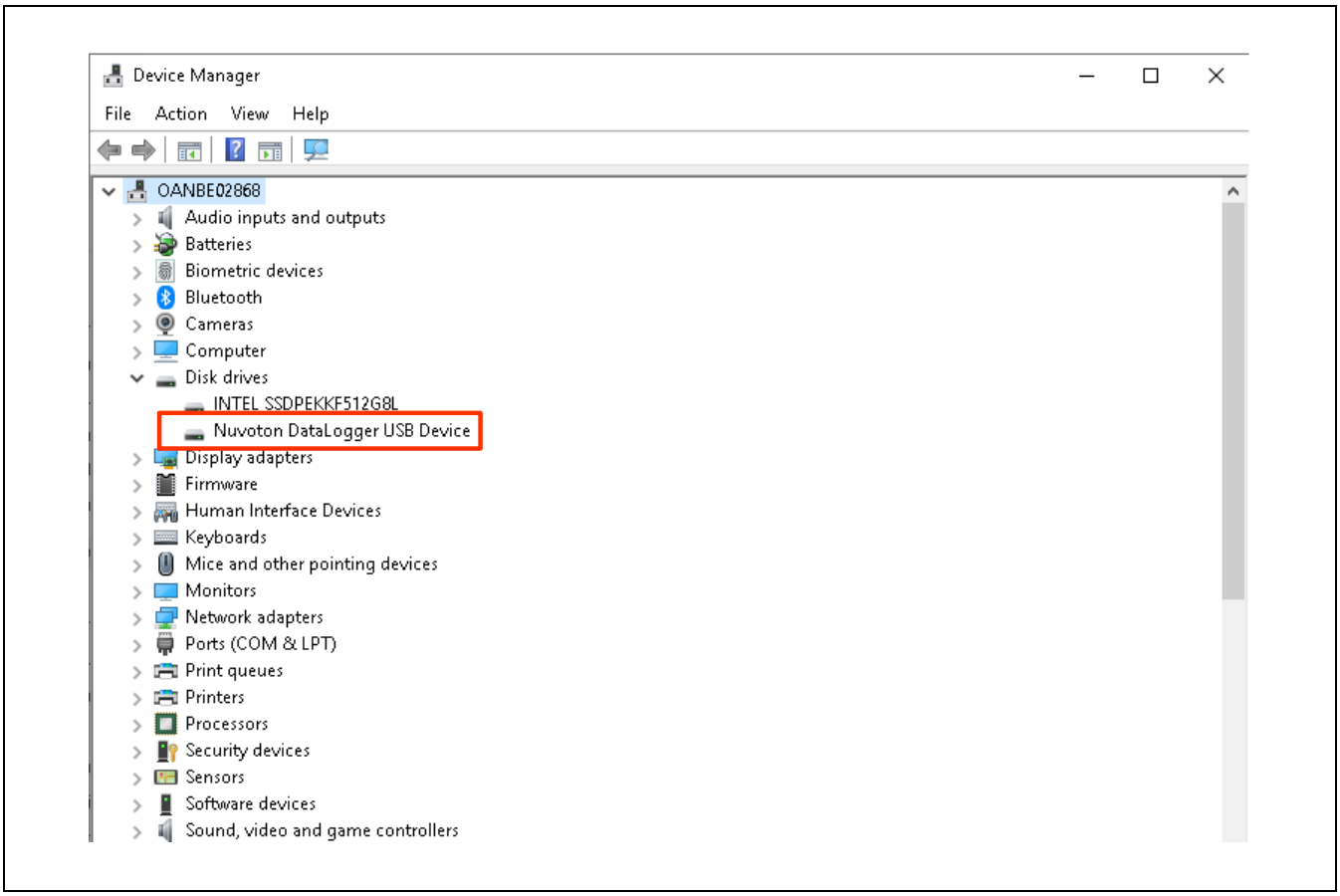

图 1-1 设备管理器画面

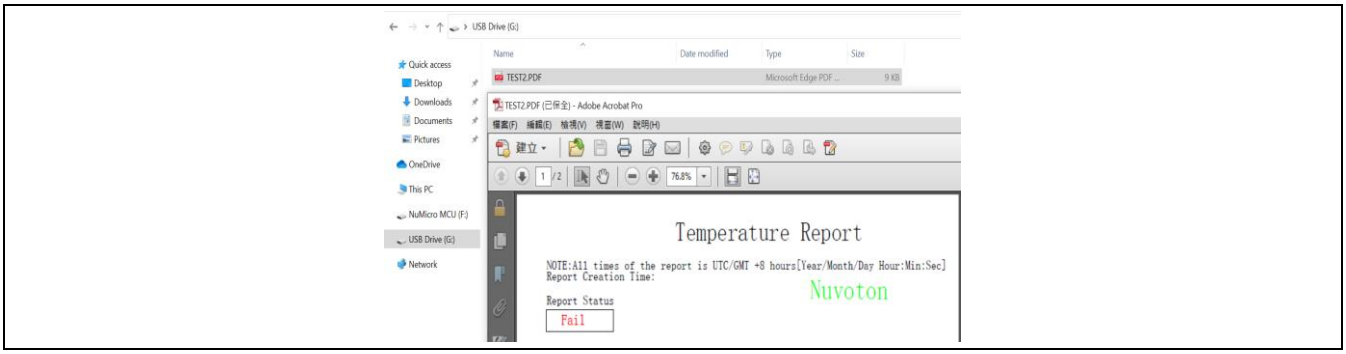
USB Drive (G:)
Quick access
Desktop
Downloads
Documents
Pictures
OneDrive
This PC
NuMicro MCU (F:)
USB Drive (G:)
Network
Name
Date modified
Type
Size
TEST2.PDF
TEST2.PDF (已保全) - Adobe Acrobat Pro
Temperature Report
NOTE:All times of the report is UTC/GMT +8 hours[Year/Month/Day Hour:Min:Sec]
Report Creation Time:
Nuvoton
Report Status
Fail

图 1-2 PDF 档案画面

2 代码介绍

用户在使用此范例代码时主要关心如何生成 PDF 文件。USB 部分的代码已标准化，不需要修改。如果要创建自己的 PDF 页面，则需要修改以下代码。

```
int newpdf(char *name, uint32_t flag, fLoop func)
{
    uint32_t height, record_width;
    uint32_t width;
    uint32_t page_cnt;
    uint32_t     res;
    static axis_t axis_temp;
    static uint32_t total_time;
    static uint32_t total_lines, total_pages;
    NPDF_STATUS status;
    volatile uint32_t  start, end, sec;

    if (flag)
    {
        memset((char *)&warning_info, 0, sizeof(warning_info));

        fsize = g_total_len;
        getDeviceConfig();

        /* Parse record file to create PDF content(e.g date, time, temperature, and so on)
The content please refer to record_t structure */
        memset((void *)&axis_temp, 0, sizeof(axis_temp));
        total_lines = getFileInfo(&axis_temp, &axis_temp.setup, &total_time);

        if (total_lines == 0)
        {
            printf("total_lines == 0\n");
            goto out;
        }

        if (total_lines != (fsize / sizeof(record_t)))
        {
            printf("Flash record crash?(%d, %d)\n", fsize, total_lines);
            goto out;
        }
         /* Calculate total pages */
        total_pages = total_lines / LINES_PER_PAGE;

        if (total_lines % LINES_PER_PAGE)
            total_pages++;

        /* Include first page */
        total_pages++;
        printf("total_lines = %d, %d\n", total_lines, total_pages);

        NPDF_Pdf_SetGetSize();

    }
    else
        NPDF_Pdf_SetCallBack(func);

    height = NPDF_Page_GetHeight();
    width = NPDF_Page_GetWidth();

    record_width = width - PAGE_LEFT_SPACE * 2;

    page_cnt = NPDF_Pdf_GetPage();
```

```
    if (page_cnt > 1) /* begin from page */
    {
        printf("jump to page %d\n", page_cnt);
        page_cnt--;
        goto data_page2;
    }

    status = NPDF_Pdf_Open(name, total_pages, stream_buffer, NPDF_STREAM_BUF_SIZE,
owner_passwd, user_passwd);

    if (status != NPDF_OK)
    {
        printf("NPDF_Pdf_Open fail:%x\n", status);
        goto out;
    }

#ifdef ENABLE_ZIP
    /* Enable compress */
    NPDF_SetCompressionMode(NPDF_COMP_ALL);
#else
    NPDF_SetCompressionMode(0/*NPDF_COMP_ALL*/);
#endif

    /********************* page1 *********************/

    CreatePage1(&axis_temp, total_time, total_lines, total_pages);


    /**********************page 2..n*****************/
data_page2:
    page2_table[0].width = record_width - 4;

    res = NPDF_FOPEN();

    if (res != FR_OK)
    {
        printf("open file zhongji.txt fail, %x\n", res);
        goto out;
    }

    if (page_cnt != 1)
    {
        /* Jump to page_cnt */
        /* Seek ( page_cnt -1 ) * LINES_PER_PAGE *sizeof(record_t) data*/
        NPDF_FSEEK((page_cnt - 1)* LINES_PER_PAGE * sizeof(record_t));
    }

    while (page_cnt < total_pages)
    {
        CreateDataPage("SimSun", "Helvetica", ++page_cnt, total_pages);

        /* last line */
        NPDF_Page_SetRGBStroke(0.0, 0.0, 0.0);  //black
        NPDF_Page_SetLineWidth(1.0);
        NPDF_Page_MoveTo(PAGE_LEFT_SPACE, (tables[4].y - 400));
        NPDF_Page_LineTo(width - PAGE_LEFT_SPACE, tables[4].y - 400);
        NPDF_Page_Stroke();
    }

    NPDF_FCLOSE();
    NPDF_Pdf_Close();
out:
    return 0;
}
```

3 软件与硬件需求

- 软件需求
  - BSP 版本
    - M251/M252/M254/M256/M258 BSP CMSIS V3.01.002
  - IDE 版本
    - Keil uVersion 5.26
- 硬件需求
  - 电路组件
    - NuMaker-M258KE Ver1.1
  - 示意图

硬件接线图如图 3-1所示。

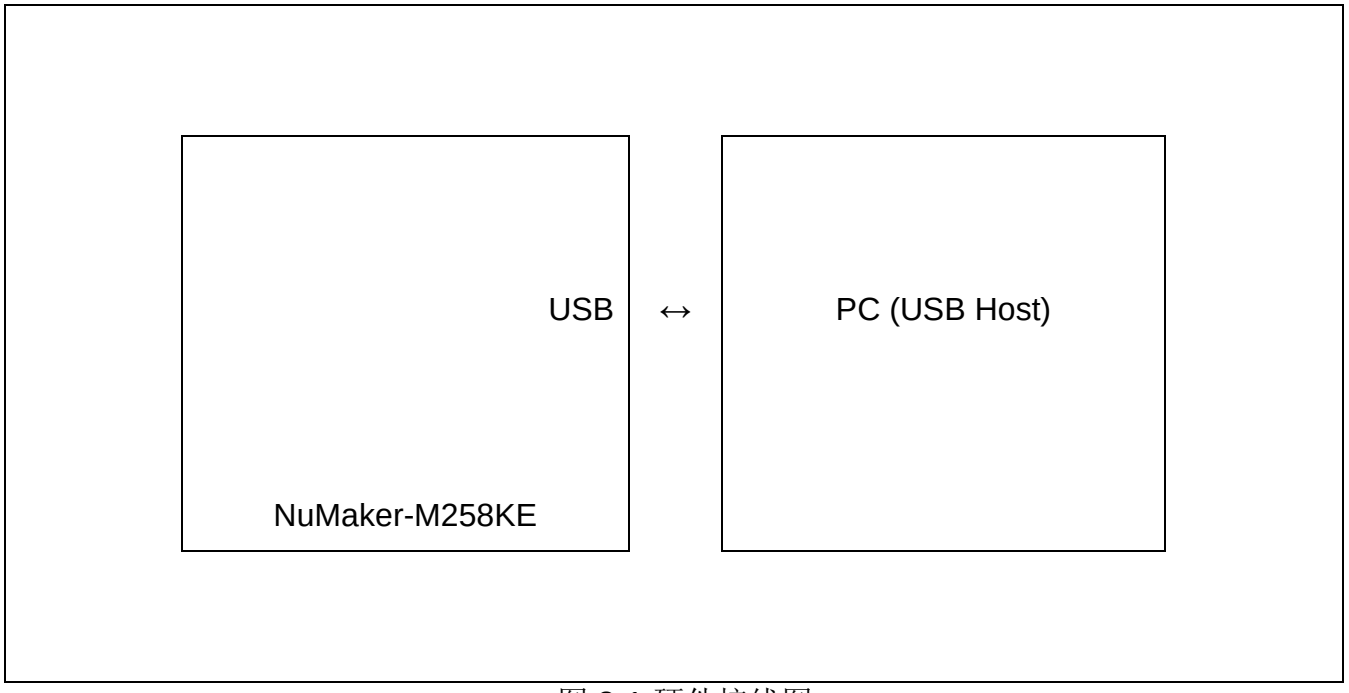

图 3-1 硬件接线图

4 目录信息

目录信息如图 4-1所示。

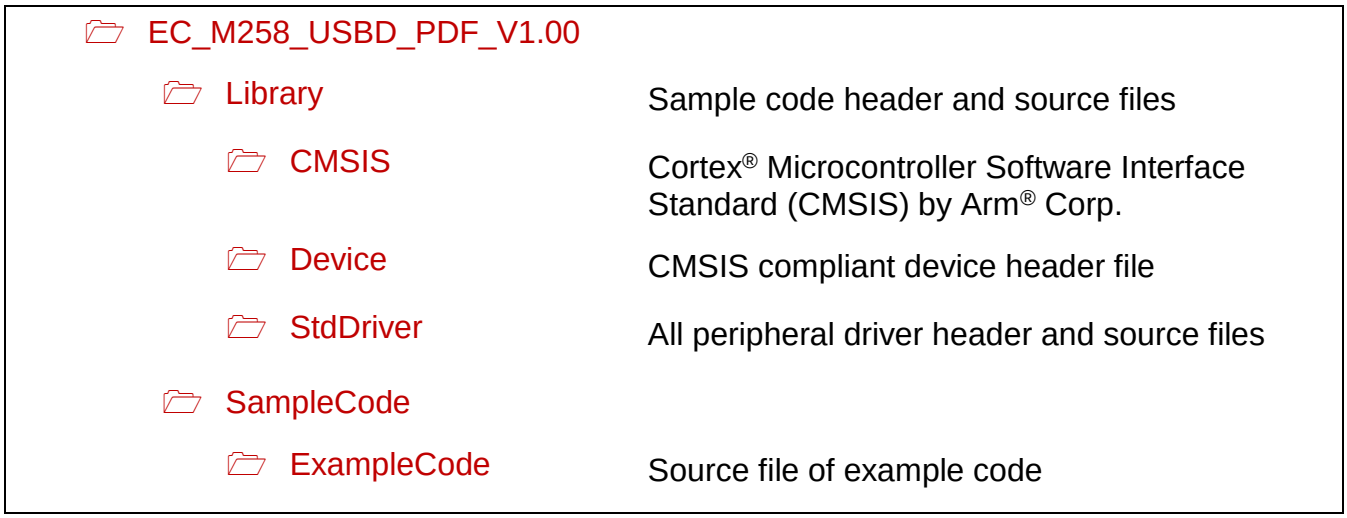

图 4-1 目录信息

5 范例程序执行

1. 根据目录信息章节进入 ExampleCode 路径中的 KEIL 文件夹，双击 *M258_USBD_PDF.uvprojx*。
2. 进入编译模式接口
   a. 编译
   b. 下载代码至内存
   c. 进入 / 离开除错模式
3. 进入除错模式接口
   a. 执行代码

6 修订纪录

Date	Revision	Description
2021.07.29	1.00	1. 初始发布.

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