# M258 產生PDF 檔案

NuMicro® 32 位系列微控制器範例代碼介紹

## 文件資訊

| | |
|---|---|
| 應用簡述 | 本範例代碼演示如何在 USB DISK 上的 FAT 檔案系統建立 PDF 檔案。 |
| BSP 版本 | M251/M252/M254/M256/M258 BSP CMSIS V3.01.002 |
| 開發平台 | NuMaker-M258KE Ver1.1 |

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# 1 概述

微控制器 M258 透過 USB 通訊埠連接電腦，實作大容量儲存裝置類別，可在USB DISK 上存取FAT 檔案系統。並且提供範例程式碼，示範如何寫入PDF 檔案到USB DISK 上的FAT 檔案系統，使用者即可將微控制器作為一般的外接 USB 隨身碟使用，可在個人電腦上進行檔案的寫入與讀取。請注意，此範例程式也適用於M252 系列。

## 1.1 執行結果

將 M258 USB 接入電腦，開啟【裝置管理員】，可看到 Disk drives 區域出現 Nuvoton DataLogger USB Device 裝置，如圖 1-1 所示。此時至【我的電腦】開啟外接裝置的儲存槽，可看到創建的PDF 檔案，執行結果如圖 1-2 所示。

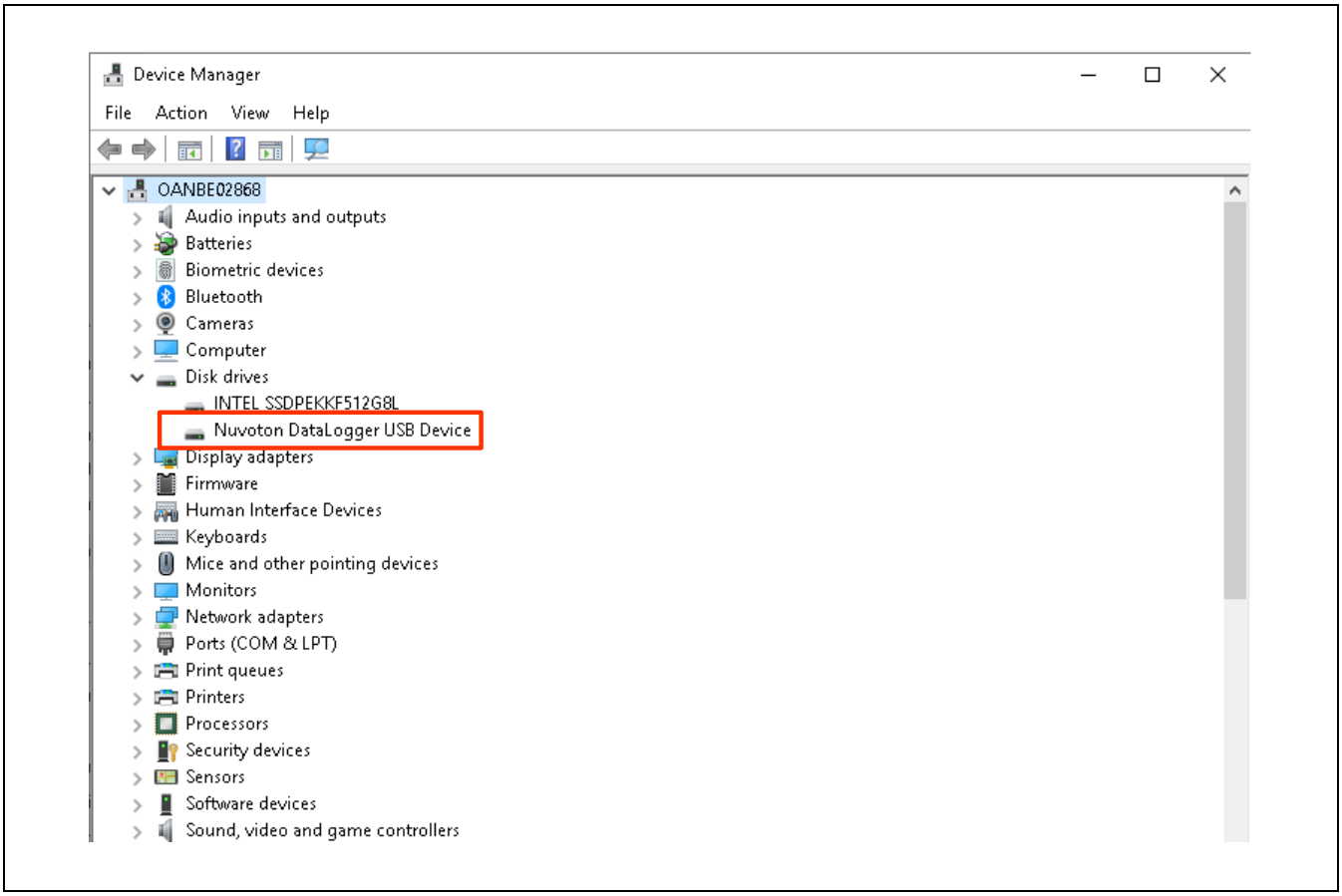


圖 1-1 裝置管理員畫面

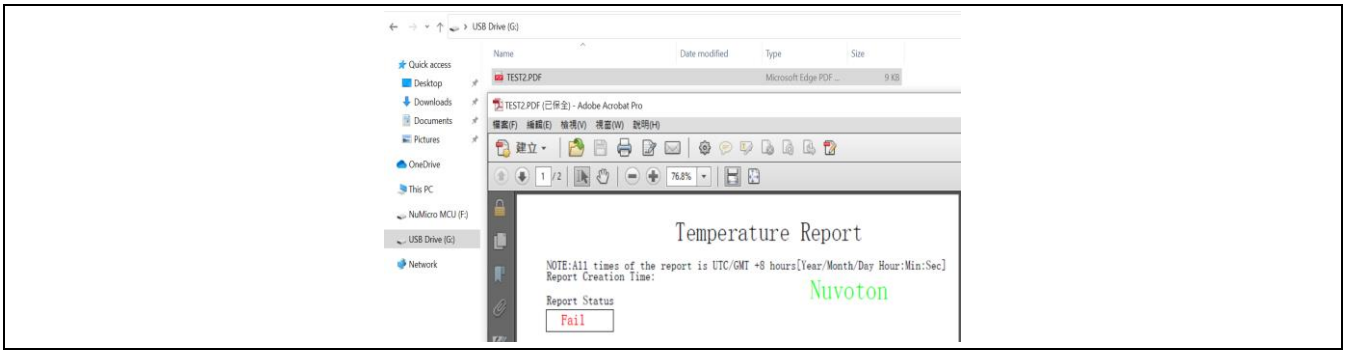
USB Drive (G:)
Quick access
Desktop
Downloads
Documents
Pictures
OneDrive
This PC
NuMicro MCU (F:)
USB Drive (G:)
Network
Name
Date modified
Type
Size
TEST2.PDF
TEST2.PDF (已保全) - Adobe Acrobat Pro
檔案(F) 編輯(E) 檢視(V) 視窗(W) 說明(H)
建立
1 /2
76.8%
Temperature Report
NOTE:All times of the report is UTC/GMT +8 hours[Year/Month/Day Hour:Min:Sec]
Report Creation Time:
Nuvoton
Report Status
Fail

圖 1-2 PDF 檔案畫面

# 2 代碼介紹

使用者在使用此範例代碼時主要關心如何生成 PDF 文件。USB 部分的代碼已標準化，不需要修改。如果要創建自己的 PDF 頁面，則需要修改以下代碼。

```
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 軟體與硬體需求

- **軟體需求**
  - BSP 版本
    - M251/M252/M254/M256/M258 BSP CMSIS V3.01.002
  - IDE 版本
    - Keil uVersion 5.26
- **硬體需求**
  - 電路元件
    - NuMaker-M258KE Ver1.1
  - 示意圖

硬體接線圖如圖 3-1所示。

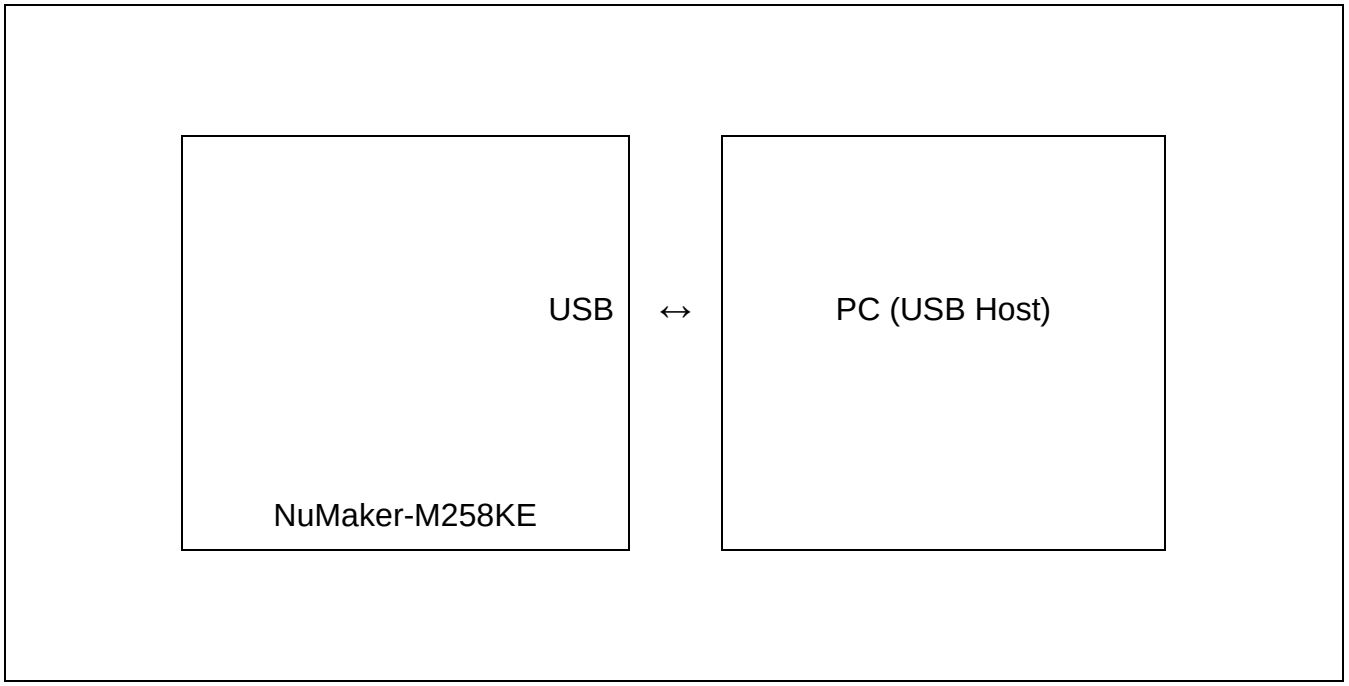


圖 3-1 硬體接線圖

# 4 目錄資訊

目錄資訊如圖 4-1所示。

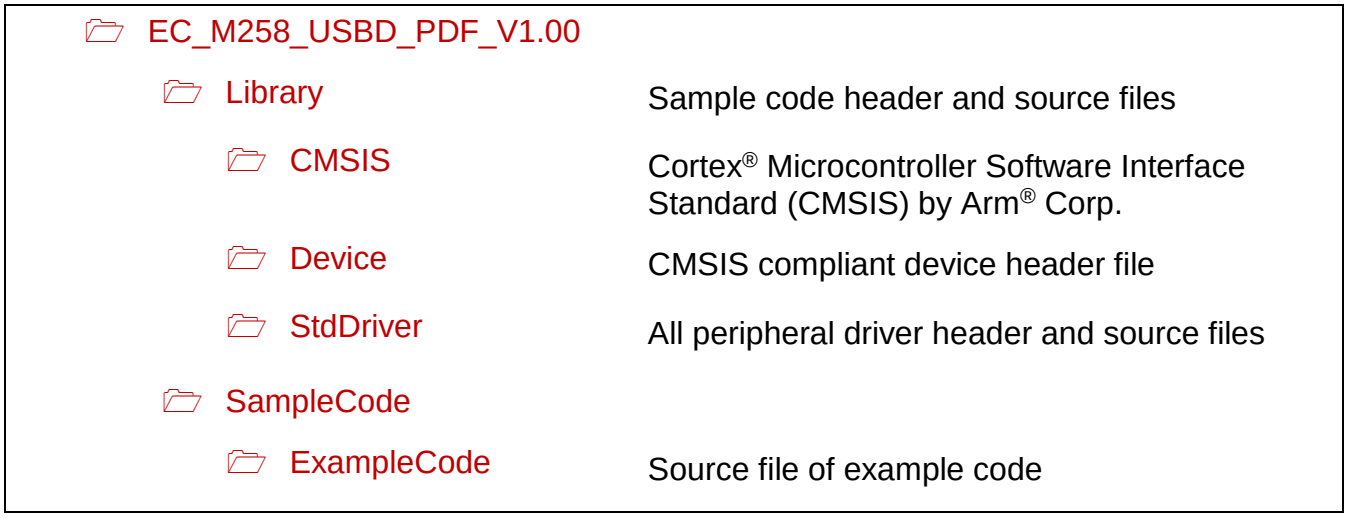


圖 4-1 目錄資訊

# 5 範例程式執行

1. 根據目錄資訊章節進入 ExampleCode 路徑中的 KEIL 資料夾，雙擊 *M258_USBD_PDF.uvprojx*。
2. 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
3. 進入除錯模式介面
   a. 執行代碼

# 6 修訂紀錄

| Date | Revision | Description |
|---|---|---|
| 2021.07.29 | 1.00 | 1. 初始發布. |

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