软体侦测杂讯

NuMicro® 32 位系列微控制器范例代码介绍

文件信息

代码简述	I/O 检测讯号时，使用系统计数器。在一定时间间隔内出现跳动，则不要反应动作，避免杂讯干扰。
BSP 版本	NUC123 Series BSP CMSIS v3.01.001
开发平台	NuTiny-EVB-123-LQFP64_V1.0

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1 功能介绍

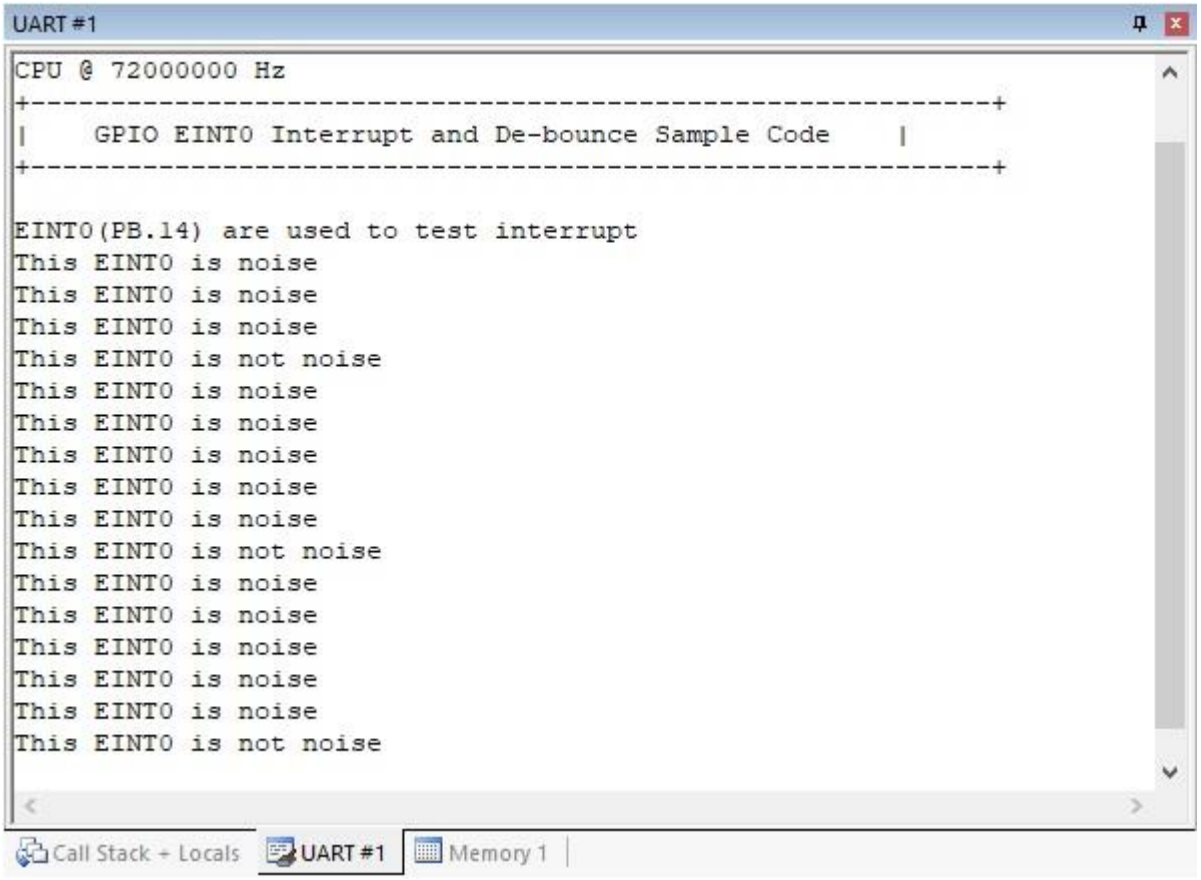
1.1 简介

一般情况下，I/O侦测讯号时，很可能被杂讯干扰，而让系统出现错误的反应。此范例是透过系统提供的计数器，把在一定时间间隔内出现的跳动，当成杂讯滤除，避免做出错误反应。

1.2 原理

在I/O侦测到讯号时，进入中断服务程序，在中断服务里设定系统计数器(SysTick)。计数器计数一定时间间隔，在时间内侦测到的讯号变化视为杂讯。如果没有侦测到变化则为正常讯号。

1.3 执行结果



2 代码介绍

EINT0 中断服务程式，清除中断旗标与设定系统计数器，印出是否为杂讯：

```
void EINT0_IRQHandler(void){
    int i, deboundce=0;

    for(i=0;i<500;i++){
        /* For PB.14, clear the INT flag */
        GPIO_CLR_INT_FLAG(PB, BIT14);
        SysTick->LOAD = 1000*CyclesPerUs;
        SysTick->VAL  = 0;
        SysTick->CTRL = SysTick_CTRL_CLKSOURCE_Msk | SysTick_CTRL_ENABLE_Msk;

        /* Waiting for down-count to zero */
        while((SysTick->CTRL & SysTick_CTRL_COUNTFLAG_Msk) == 0) {
            if(PB14==1){
                PB13^=1;
                deboundce=1;
                printf("This EINT0 is noise\n");
                goto exit_int0;
            }
        }
    }

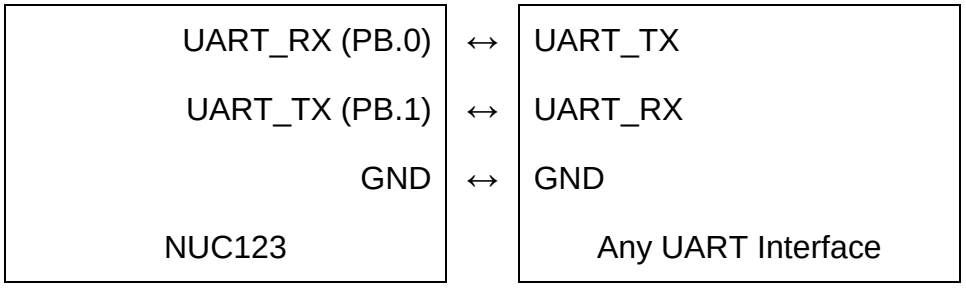
    if(deboundce==0){
        PB12^=1;
        printf("This EINT0 is not noise\n");
    }
exit_int0:
    return;
}
```

设定 PB.14 侦测外部讯号与对应的中断服务程式：

```
 /* Configure PB.14 as EINT0 pin and enable interrupt by falling edge trigger */
GPIO_SetMode(PB, BIT14, GPIO_PMD_QUASI);
GPIO_EnableEINT0(PB, 14, GPIO_INT_FALLING);
NVIC_EnableIRQ(EINT0_IRQn);
```

3 软件与硬件环境

- 软件环境
  - BSP 版本
    - NUC123 Series BSP CMSIS v3.01.001
  - IDE 版本
    - Keil uVersion 5.26
- 硬件环境
  - 电路组件
    - NuTiny-EVB-123-LQFP64_V1.0
  - 示意图



4 目录信息

EC_NUC123_Software_Debounce_V1.00	
Library	Sample code header and source files
CMSIS	Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
Device	CMSIS compliant device header file
StdDriver	All peripheral driver header and source files
SampleCode	
ExampleCode	Source file of example code

5 如何执行范例程序

1. 根据目录信息章节进入 ExampleCode 路径中的 KEIL 文件夹，双击 NUC123_Software_Debounce.uvproj。
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
Oct. 24, 2019	1.00	1. 初始发布.

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