

# KEIL 分散加载说明

## 1. 将.c 文件加载到指定位置

要实现 keil 下的分散加载，需要修改.sct 文件，本工程要实现将 hw\_config.c 文件加载到 0x08002000 起始位置，本工程的.sct 文件为 “ScatterLoading\Project\KEIL\MDK-ARM\ Project.sct”。

打开如下：

```
. *****
;
; *** Scatter-Loading Description File generated by uVision ***
; *****
;

LR_IROM1 0x08000000 0x00002000 {    ; load region size_region
  ER_IROM1 0x08000000 0x00002000 { ; load address = execution address
    *.o (RESET, +First)
    *(InRoot$$Sections)
  }

  RW_IRAM1 0x20000000 0x00002000 { ; RW data
    .ANY (+RW +ZI)
  }
}

LR_IROM2 0x08002000 0x00000050 {
  ER_IROM2 0x08002000 0x00000050 { ; 将 hw_config.c 文件分散加载到 0x08002000 以后的区域
    hw_config.o (+RO)
  }
}

LR_IROM3 0x0800dfb0 0x00000040 {
  ER_IROM3 0x0800dfb0 0x00000040 { ; 将 main.c 中 delay()函数定义为 section “delay”，然后分
    散加载到 0x0800dfb0 以后的区域
    main.o (delay)
  }
}

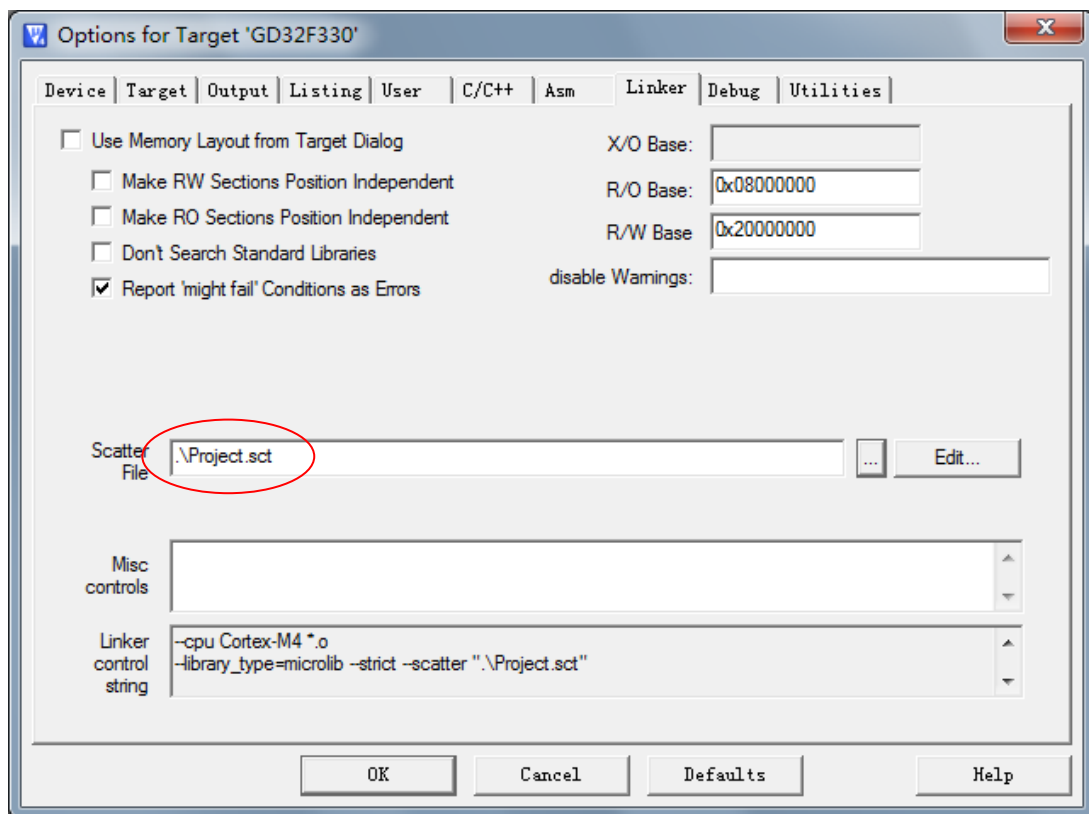
LR_IROM4 0x08002050 0x000dfb0 {
  ER_IROM4 0x08002050 0x000dfb0 { ; load address = execution address
    .ANY (+RO)
  }
}
```

红色部分为实现分散加载所添加部分，想要实现将 hw\_config.c 加载到 0x08002000 起始位置只需要在

sct 文件中加入以下代码即可：

```
LR_IROM2 0x08002000 0x00000050 {  
    ER_IROM2 0x08002000 0x00000050 { ; 将 hw_config.c 文件分散加载到 0x08002000 以后的区域  
        hw_config.o (+RO)  
    }  
}
```

## 2. keil 中添加上面修改的 sct 文件



## 3. 将函数加载到指定位置

本工程实现的是将 main.c 文件中的 delay 函数加载到 0x0800dfb0 起始位置。

1、 在.sct 文件中加入以下代码：

```
LR_IROM3 0x0800dfb0 0x00000040 {  
    ER_IROM3 0x0800dfb0 0x00000040 { ; 将 main.c 中 delay()函数定义为 section “delay”，  
        然后分散加载到 0x0800dfb0 以后的区域  
        main.o(delay)  
    }  
}
```

2、 在函数的定义处添加\_\_attribute\_\_((section("delay"))), 具体代码如下：

```

void delay(void) __attribute__((section("delay")));
void delay(void)
{
    for(i=0;i<0xffff;i++);
}

```

#### 4. 将数组加载到指定位置

```

/*将只读数组constdata移到0x08003000以后的区域*/
const char constdata[] __attribute__((at(0x08003000)))={

    0x52,0x49,0x46,0x46,0xB4,0x5C,0x03,0x00,
    0x57,0x41,0x56,0x45,0x66,0x6D,0x74,0x20,
    0x10,0x00,0x00,0x00,0x01,0x00,0x02,0x00,
    0x80,0x3E,0x00,0x00,0x00,0xFA,0x00,0x00,
    0x04,0x00,0x10,0x00,0x64,0x61,0x74,0x61,
    0x90,0x5C,0x03,0x00,0x00,0x00,0x00,0x00,
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
    0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,
}

```

#### 5. 结果

打开“ScatterLoading\Project\KEIL\MDK-ARM\list\Project.map”文件，如下：

```

Load·Region·LR_IROM2·(Base·:0x08002000,·Size·:0x00000010,·Max·:0x00000050,·ABSOLUTE)

..Execution·Region·ER_IROM2·(Base·:0x08002000,·Size·:0x00000010,·Max·:0x00000050,·ABSOLUTE)

..Base·Addr·····Size······Type···Attr·····Idx·····E·Section·Name·····Object
0x08002000···0x0000000e···Code···RO······137·····i.interrupt_config··hw_config.o

Load·Region·LR_IROM3·(Base·:0x0800dfb0,·Size·:0x00000014,·Max·:0x00000040,·ABSOLUTE)
..Execution·Region·ER_IROM3·(Base·:0x0800dfb0,·Size·:0x00000014,·Max·:0x00000040,·ABSOLUTE)

..Base·Addr·····Size······Type···Attr·····Idx·····E·Section·Name·····Object
0x0800dfb0···0x00000014···Code···RO······3·····delay·····main.o

Load·Region·LR_IROM4·(Base·:0x08002050,·Size·:0x000094a0,·Max·:0x0000dfb0,·ABSOLUTE)
..Execution·Region·ER_IROM4·(Base·:0x08002050,·Size·:0x000094a0,·Max·:0x0000dfb0,·ABSOLUTE)

..Base·Addr·····Size······Type···Attr·····Idx·····E·Section·Name·····Object
0x08002050···0x00000024···Code···RO······3515·····.text·····startup_gd32f3x0.o
0x08002074···0x000000c8···Code···RO······158·····i.SystemInit·····system_gd32f3x0.o
0x0800213c···0x00000054···Code···RO······3524·····i.gd_eval_led_init··gd32f3x0_eval.o
0x08002190···0x00000018···Code···RO······3527·····i.gd_eval_led_toggle··gd32f3x0_eval.o
0x080021a8···0x0000004e···Code···RO······1414·····i.gpio_mode_set·····gd32f3x0_gpio.o
0x080021f6···0x0000007c···Code···RO······1416·····i.gpio_output_options_set··gd32f3x0_gpio.o
0x08002272···0x00000018···Code···RO······4·····i.main·····main.o
0x0800228a···0x00000002···PAD
0x0800228c···0x00000014···Code···RO······1707·····i.nvic_vector_table_set··gd32f3x0_misc.o
0x080022a0···0x00000020···Code···RO······1789·····i.rcu_periph_clock_enable··gd32f3x0_rcu.o
0x080022c0···0x000000c0···Code···RO······159·····i.system_clock_108m_hxtal··system_gd32f3x0.o
0x08002380···0x00000008···Code···RO······160·····i.system_clock_config··system_gd32f3x0.o
0x08002388···0x00000078···PAD
0x08003000···0x0000084f0···Data···RO······128·····ARM.__AT_0x08003000··const-data.o

```